Vol. 1111 Number 1

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

February 6, 1990

U.S.
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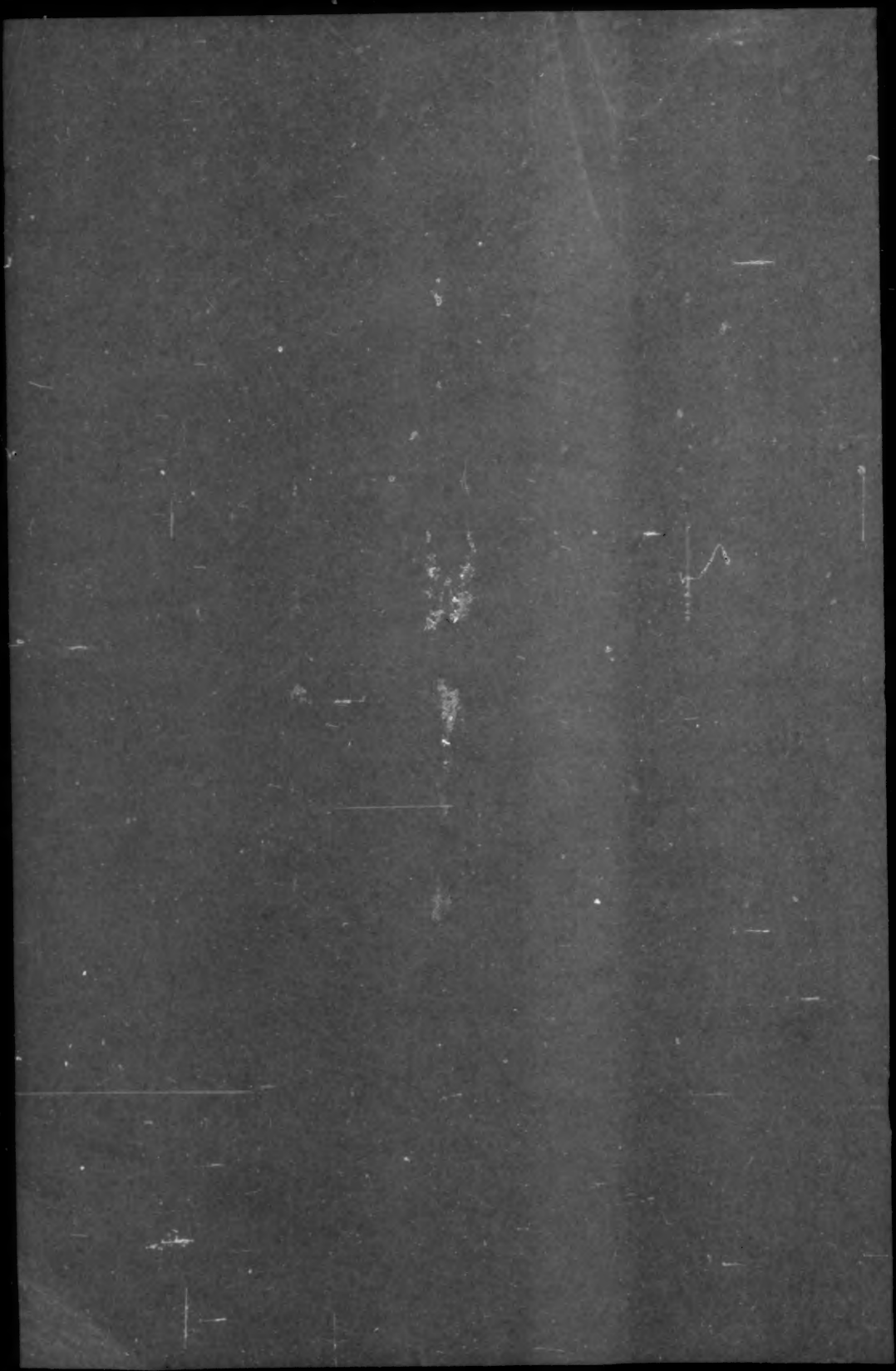

OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE

February 6, 1990 Volume 1111 Number 1

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1111 OG 2
Notice of Maintenance Fees Payable	1111 OG 2
Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees	1111 OG 3
Notification of Acceptance of Delayed Payment of Maintenance Fee	1111 OG 4
Reissue Applications Filed	1111 OG 5
Requests for Reexaminations Filed	1111 OG 5
Registration to Practice	1111 OG 5
Notice by Publication	1111 OG 6
Reclassification Alert Report	1111 OG 7
Patent Certificates of Correction	1111 OG 8
Special Boxes for Mail	1111 OG 9
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1111 OG 10
Condition of Patent Applications	1111 OG 12
Reexaminations	1
Statutory Invention Registrations	3
Reissue Patents Granted (33,158)	9
Plant Patents Granted (7,136)	11
Patents Granted	
General and Mechanical (4,897,885)	13
Chemical (4,898,595)	257
Electrical (4,899,018)	377
Design Patents Granted (305,825)	507
Index of Patentees	PI 1
Indices of Reissue, Reexamination, Design, Plant Patentees and Statutory Invention Registration	PI 63
Classification of	
Patents (Including Reissues and Reexaminations)	PI 69
Designs, and Plants Applications	PI 72
Geographical Index of Residence of Inventors	
Patents (Including Reissues and Reexaminations)	PI 73
Designs and Plant Applications	PI 74
Change of Address Form and Subscription Order Form	Back Page

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THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
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GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

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Printing authorized by Section 11(a)3 of Title 35, U.S. P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1109 O.G. 3 on Dec. 5, 1989.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 5 on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

The search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar in relation to the German Mark as of Jan. 1, 1990, and was announced in the *Official Gazette* at 1109 O.G. 3 on Dec. 5, 1989.

International PCT fees were changed on June 1, 1989 due to a difference in the exchange rate of the U.S. dollar in relaton to the Swiss Franc and were announced in the *Official Gazette* at 1102 O.G. 90 on May 30, 1989.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	1140.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA.	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	436.00
Basic Supplemental fee (for each page over 30)	9.00
Designation fee per country or region for the first 10 national or regional offices	106.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	134.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	30.00	30.00

Dec. 18, 1989

JEFFREY M. SAMUELS
Acting Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on February 3, 1987 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,639,944 through 4,641,378
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on February 1, 1983 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,370,754 through 4,371,982
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force

beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$245.00
By other than a small entity.....$490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$495.00
By other than a small enttity.....$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27,1982.....$120.00

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED NOVEMBER 19, 1989 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,300,367	06/219,569	11/17/81
4,300,496	06/218,359	11/17/81
4,300,943	06/222,219	11/17/81
4,301,160	06/216,957	11/17/81
4,553,270	06/462,894	11/19/85
4,553,274	06/661,426	11/19/85
4,553,276	06/473,587	11/19/85
4,553,277	06/556,373	11/19/85
4,553,278	06/603,490	11/19/85
4,553,279	06/542,266	11/19/85
4,553,288	06/614,724	11/19/85
4,553,291	06/644,357	11/19/85
4,553,298	06/634,357	11/19/85
4,553,300	06/614,808	11/19/85
4,553,301	06/607,059	11/19/85
4,553,304	06/499,398	11/19/85
4,553,305	06/554,570	11/19/85
4,553,306	06/548,942	11/19/85
4,553,325	06/612,575	11/19/85
4,553,333	06/640,637	11/19/85
4,553,341	06/638,961	11/19/85
4,553,347	06/624,052	11/19/85
4,553,349	06/528,180	11/19/85
4,553,355	06/580,194	11/19/85
4,553,363	06/421,826	11/19/85
4,553,365	06/537,523	11/19/85
4,553,382	06/532,986	11/19/85
4,553,383	06/561,546	11/19/85
4,553,385	06/553,083	11/19/85
4,553,394	06/485,486	11/19/85
4,553,395	06/499,201	11/19/85
4,553,396	06/606,529	11/19/85
4,553,418	06/589,758	11/19/85
4,553,419	06/363,172	11/19/85
4,553,420	06/537,681	11/19/85
4,553,433	06/494,598	11/19/85
4,553,440	06/323,193	11/19/85
4,553,453	06/616,122	11/19/85
4,553,466	06/516,255	11/19/85
4,553,467	06/544,694	11/19/85
4,553,468	06/532,710	11/19/85
4,553,479	06/483,916	11/19/85
4,553,480	06/519,839	11/19/85
4,553,481	06/599,093	11/19/85
4,553,483	06/398,347	11/19/85
4,553,484	06/429,062	11/19/85
4,553,490	06/648,658	11/19/85
4,553,492	06/648,927	11/19/85
4,553,494	06/578,747	11/19/85
4,553,503	06/525,126	11/19/85
4,553,509	06/630,698	11/19/85
4,553,524	06/529,498	11/19/85
4,553,528	06/336,886	11/19/85
4,553,544	06/660,391	11/19/85
4,553,557	06/498,650	11/19/85
4,553,560	06/504,219	11/19/85
4,553,575	06/561,213	11/19/85
4,553,576	06/634,045	11/19/85
4,553,577	06/609,865	11/19/85
4,553,581	06/483,792	11/19/85
4,553,582	06/661,251	11/19/85
4,553,584	06/558,932	11/19/85
4,553,589	06/630,122	11/19/85
4,553,590	06/575,844	11/19/85
4,553,592	06/578,453	11/19/85
4,553,610	06/588,947	11/19/85
4,553,612	06/549,876	11/19/85
4,553,618	06/522,435	11/19/85
4,553,635	06/727,106	11/19/85
4,553,636	06/596,351	11/19/85
4,553,637	06/594,788	11/19/85
4,553,645	06/575,619	11/19/85
4,553,658	06/491,240	11/19/85
4,553,664	06/567,147	11/19/85
4,553,665	06/537,383	11/19/85
4,553,667	06/560,048	11/19/85
4,553,671	06/529,155	11/19/85
4,553,678	06/623,033	11/19/85
4,553,683	06/635,409	11/19/85
4,553,684	06/677,072	11/19/85
4,553,686	06/611,473	11/19/85
4,553,687	06/431,682	11/19/85
4,553,691	06/639,625	11/19/85
4,553,695	06/568,057	11/19/85
4,553,719	06/717,644	11/19/85
4,553,724	06/555,597	11/19/85
4,553,735	06/339,092	11/19/85
4,553,737	06/707,684	11/19/85

Patent Number	Serial Number	Issue Date
4,553,740	06/606,630	11/19/85
4,553,748	06/517,465	11/19/85
4,553,749	06/542,159	11/19/85
4,553,752	06/674,497	11/19/85
4,553,758	06/736,451	11/19/85
4,553,766	06/441,629	11/19/85
4,553,770	06/511,382	11/19/85
4,553,773	06/520,810	11/19/85
4,553,774	06/529,640	11/19/85
4,553,777	06/482,784	11/19/85
4,553,778	06/492,176	11/19/85
4,553,781	06/519,076	11/19/85
4,553,782	06/580,111	11/19/85
4,553,784	06/447,101	11/19/85
4,553,785	06/534,608	11/19/85
4,553,790	06/648,233	11/19/85
4,553,791	06/541,103	11/19/85
4,553,798	06/596,610	11/19/85
4,553,811	06/427,893	11/19/85
4,553,818	06/560,689	11/19/85
4,553,825	06/503,228	11/19/85
4,553,827	06/510,073	11/19/85
4,553,832	06/606,017	11/19/85
4,553,847	06/444,079	11/19/85
4,553,854	06/558,943	11/19/85
4,553,855	06/662,006	11/19/85
4,553,857	06/564,282	11/19/85
4,553,858	06/659,331	11/19/85
4,553,870	06/623,684	11/19/85
4,553,873	06/386,572	11/19/85
4,553,875	06/546,964	11/19/85
4,553,876	06/543,543	11/19/85
4,553,880	06/621,757	11/19/85
4,553,890	06/543,501	11/19/85
4,553,891	06/337,874	11/19/85
4,553,897	06/620,682	11/19/85
4,553,898	06/541,876	11/19/85
4,553,904	06/655,289	11/19/85
4,553,909	06/500,177	11/19/85
4,553,910	06/522,382	11/19/85
4,553,920	06/511,997	11/19/85
4,553,921	06/536,845	11/19/85
4,553,922	06/653,495	11/19/85
4,553,928	06/469,551	11/19/85
4,553,930	06/513,142	11/19/85
4,553,937	06/625,072	11/19/85
4,553,939	06/625,214	11/19/85
4,553,946	06/595,822	11/19/85
4,553,949	06/519,334	11/19/85
4,553,965	06/626,607	11/19/85
4,553,974	06/640,725	11/19/85
4,553,990	06/608,963	11/19/85
4,553,996	06/589,450	11/19/85
4,554,009	06/643,605	11/19/85
4,554,024	06/579,625	11/19/85
4,554,025	06/712,506	11/19/85
4,554,027	06/611,164	11/19/85
4,554,034	06/671,665	11/19/85
4,554,037	06/618,879	11/19/85
4,554,039	06/595,997	11/19/85
4,554,041	06/604,616	11/19/85
4,554,051	06/610,680	11/19/85
4,554,058	06/710,759	11/19/85
4,554,061	06/435,031	11/19/85
4,554,065	06/606,499	11/19/85
4,554,074	06/633,049	11/19/85
4,554,077	06/528,105	11/19/85
4,554,080	06/606,111	11/19/85
4,554,090	06/587,494	11/19/85
4,554,095	06/630,693	11/19/85
4,554,096	06/656,652	11/19/85
4,554,108	06/517,297	11/19/85
4,554,110	06/565,888	11/19/85
4,554,111	06/642,771	11/19/85
4,554,118	06/550,383	11/19/85
4,554,124	06/506,526	11/19/85
4,554,148	06/611,152	11/19/85
4,554,170	06/490,676	11/19/85
4,554,208	06/674,239	11/19/85
4,554,239	06/700,072	11/19/85
4,554,262	06/655,816	11/19/85
4,554,270	06/672,049	11/19/85
4,554,273	06/578,046	11/19/85
4,544,281	06/545,930	11/19/85
4,554,283	06/643,331	11/19/85
4,554,291	06/616,099	11/19/85
4,554,302	06/688,245	11/19/85
4,554,336	06/546,472	11/19/85
4,554,339	06/493,500	11/19/85
4,554,350	06/522,261	11/19/85
4,554,371	06/637,062	11/19/85
4,554,383	06/644,118	11/19/85
4,554,384	06/656,661	11/19/85
4,554,385	06/709,916	11/19/85
4,554,413	06/616,566	11/19/85
4,554,415	06/463,725	11/19/85
4,554,431	06/617,211	11/19/85
4,554,433	06/637,427	11/19/85
4,554,442	06/694,554	11/19/85
4,554,446	06/552,916	11/19/85
4,554,453	06/594,090	11/19/85
4,554,464	06/413,051	11/19/85
4,554,468	06/510,044	11/19/85
4,554,486	06/663,329	11/19/85
4,554,522	06/541,716	11/19/85
4,554,524	06/643,511	11/19/85
4,554,553	06/621,119	11/19/85
4,554,555	06/560,089	11/19/85
4,554,556	06/489,423	11/19/85
4,554,568	06/391,919	11/19/85
4,554,569	06/441,530	11/19/85
4,554,589	06/669,001	11/19/85
4,554,605	06/408,413	11/19/85
4,554,610	06/616,516	11/19/85
4,554,614	06/498,618	11/19/85
4,554,617	06/663,411	11/19/85
4,554,629	06/468,336	11/19/85
4,554,630	06/295,765	11/19/85
4,554,668	06/496,564	11/19/85

NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE (35 U. S. C. 41(c); 37 CFR 1.378)

The patent(s) listed below are considered as not having expired but are subject to the conditions set forth in 35 U. S. C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U. S. C. 41(c)(10 and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,494,594	06/299,999	01/22/85	09/08/81	11/27/89
4,528,307	06/532,282	07/09/85	09/15/83	12/06/89

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,423,882, Reissue S. N. 07/451,458, Filed Dec. 15, 1989, Cl. 280/33.99B, SHOPPING CART WITH BABY SEAT, Don A. Stover, et al., Owner of Record: *UNR Industries, Inc., Chicago, Ill.*, Attorney or Agent: Allen J. Hoover, Ex. Gp.: 316

4,678,856, Reissue S. N. 07/420,364, Filed Oct. 12, 1989, Cl. 560/24, METHOD OF MANUFACTURING AROMATIC URETHANE AND INTERMEDIATE PRODUCT THEREOF, Takao Ikariya, Owner of Record: *Nippon Kikan Kabushiki Kaisha, Tokyo, Japan*, Attorney or Agent: Herbert Goodman, Ex. Gp.: 126

4,701,131, Reissue S. N. 07/423,189, Filed Oct. 18, 1989, Cl. 434/211, GEOMETRIC MODELING KIT AND METHOD OF MAKING SAME, Paul R. Hildebrandt et al., Owner of Record: *Inventor*, Attorney or Agent: John E. Reilly, Ex. Gp.: 334

4,704,220, Reissue S. N. 07/431,407, Filed Nov. 3, 1989, Cl. 252/75, OIL-IN-ALCOHOL MICROEMULSIONS IN ANTI-FREEZE, Errol D. Goddard, Owner of Record: *First Brands Corp., Danbury, Conn.*, Attorney or Agent: Gary L. Wamer, Ex. Gp.: 115

4,710,230, Reissue S. N. 07/452,616, Filed Dec. 18, 1989, Cl. 106/308N, PIGMENT PASTE, Noboru Okoshi, et al., Owner of Record: *Dainippon Ink and Chemicals, Inc., Tokyo, Japan*, Attorney or Agent: Richard A. Steinberg, Ex. Gp.: 115

4,711,300, Reissue S. N. 07/451,519, Filed Dec. 6, 1989, Cl. 166/153, DOWNHOLE CEMENTING TOOL ASSEMBLY, Louis J. Wardlaw III, Owner of Record: *Inventor*, Attorney or Agent: *William C. Norvell* Jr., Ex. Gp.: 356

4,711,348, Reissue S. N. 07/447,047, Filed Dec. 7, 1989, Cl. 206/45.29, CONTAINER FOR PRODUCT SAMPLES, Allen Schluger, Owner of Record: *Inventor*, Attorney or Agent: Myron Amer, Ex. Gp.: 241

4,712,232, Reissue S. N. 07/447,387, Filed Dec. 7, 1989, Cl. 379/329, MULTIPLE TELEPHONE JACK ASSEMBLY, E. Walter Rodgers, Owner of Record: *Wade Lup Rodgers, Glendale, Ariz.*, Attorney or Agent: Marvin A. Glazer, Ex. Gp.: 261

4,712,566, Reissue S. N. 07/451,982, Filed Dec. 15, 1989, Cl. 128/748, DEVICE FOR RECORDING PHYSIOLOGICAL PRESSURES, Bertil Hok, Owner of Record: *Radisensor Ab., Uppsala, Sweden*, Attorney or Agent: Arthur Schwartz, Ex. Gp.: 335

4,712,879, Reissue S. N. 07/450,740, Filed Dec. 14, 1989, Cl. 350/357, ELECTROCHROMIC DEVICE, Naill R. Lynam, Owner of Record: *Donnelly Corp., Holland, Mich.*, Attorney or Agent: James A. Mitchell, Ex. Gp.: 252

4,718,872, Reissue S. N. 07/452,559, Filed Dec. 18, 1989, Cl. 440/1, AUTOMATIC TRIM SYSTEM, Jeffrey A. Olson, et al., Owner of Record: *Inventor*, Attorney or Agent: David R. Price, Ex. Gp.: 315

4,719,523, Reissue S. N. 07/452,492, Filed Dec. 19, 1989, Cl. 360/51, SYCHRONIZING SIGNAL DETECTING CIRCUIT, Ken Kutaragi, Owner of Record: *Sony Corp., Tokyo, Japan*, Attorney or Agent: Jay H. Maioli, Ex. Gp.: 235

4,744,161, Reissue S. N. 07/449,539, Filed Dec. 12, 1989, Cl. 040/002.R, LABEL, David J. Instance, Owner of Record; *Inventor*, Attorney or Agent: Unknown, Ex. Gp.:357

4,770,242, Reissue S. N. 07/451,761, Filed Dec. 18, 1989, Cl. 165/185, COOLING DEVICE OF SEMICONDUCTOR CHIPS, Takahiro Daikoko, et al., Owner of Record: *Inventor*, Attorney or Agent: Stanley A. Wal, Ex. Gp.: 347

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

4,500,777, Reexam No. 90/001,911, Requested Dec. 21, 1989, Cl. 235/487, HIGH DATA CAPACITY SCRATCH AND DUST RESISTANT INFRARED, READ-WRITE DATA CARD FOR AUTOMATIC TELLER MACHINES, Jerome Drexler, Owner of Record: *Drexler Corp., Mountain View, Calif.*, Attorney or Agent: None, Ex. Gp.: 230, Requester: Optical Recording Corp., Toronto, Ontario, Canada

4,825,811, Reexam No. 90/001,912, Requested Dec. 14, 1989, Cl. 119/51.500, ANIMAL FEEDING DEVICE, Charles O'Kelley, Owner of Record: *Inventor*, Chicago, Ill., Attorney or Agent: Ralph R. Rath, Ex. Gp.: 330, Requester: Owner

REGISTRATION TO PRACTICE

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished the Director, Office of Enrollment and Discipline on or before February 28, 1990:

Ben-Oliel, Susan M. M., 110-1345 West 4th Ave., Vancouver, B.C., V6H 3Y8, Canada
Brigance, Gerald L., Route 1, Box 553F, Bumpass, Va. 23024
Callaghan, Thomas F., 7203 Countrywood Crt., Springfield, Va. 22151
Caress, Virginia B., 3906 Cherrywood La., Annandale, Va. 22003
Chi, James K., 1716 Arbor View Rd., Wheaton, Md. 20902
Jaudon, Henry S., 108 Forest Ave., Elberton, Ga. 30635
Jones, Herman O., 169 Chesapeake St., S. W. Washington, D. C. 20032
Lastova, MaryAnn S., 610 S. 21st St., Arlinton, Va. 22202
Moon, Charlie T., Route 1, Box 57D, Broad Run, Va. 22014
Nassif, Omar A., 172 Norton Ave., North York, Ont., M2N 4A9, Canada
Oechsle, Anton O., 2889 Sutton Oaks La., Vienna, Va. 22181
Powell, Everette A., Jr., P.O. Box 489, Culpeper, Va. 22701
Pinkham, Richard C., 5606 37th Ave., Hyattsville, Md. 20782
Prizant, James, 1900 S. Eads St., #1107, Arlington, Va. 22202
Rutledge, L. Dewayne, 109 Thorpes Parish, Williamsburg, Va. 23185
Swisher, Nancy A. B., 2001 S. Arlington Ridge Rd., Arlington, Va. 22202
Torchin, Norman G., 5225 Pooks Hill Rd., #218N, Bethesda, Md. 20814
Truluck, Dalton L., 2635 Childs La., Alexandria, Va. 22308

United States Patent and Trademark Office
Before the Commissioner of Patents and Trademarks

CAMERON WEIFFENBACH, Director, Office of Enrollment and Discipline

v.

Proceeding No. D89-6

WESLEY TURNER, Respondent.

NOTICE BY PUBLICATION

Notice is hereby given to the above named respondent that proceedings under 35 U.S.C. § 32 have been instituted against him. A copy of the COMPLAINT AND NOTICE OF PROCEEDINGS UNDER 35 U.S.C. 32, including the charges against respondent, was twice mailed to respondent's residence address of record and business address of record. The COMPLAINT AND NOTICE was twice returned from respondent's residence and business addresses of record by the U.S. Postal Service.

Respondent may obtain a copy of the above-mentioned COMPLAINT AND NOTICE from:

John H. Raubitschek
Associate Solicitor
U.S. Patent and Trademark Office
Office of Enrollment and Discipline
P.O. Box 15667
Arlington, Va. 22215

This notice will appear in the *Official Gazette* for four (4) consecutive weeks beginning with the issue of January 30, 1990.

Respondent has thirty (30) days from the date of the last publication of this notice to file and answer to the charges against him. Failure to file an answer will be taken as an admission of the charges. 37 CFR § 10.136(d).

CAMERON WEIFFENBACH, *Director*
Office of Enrollment and Discipline

January 4, 1990

Reclassification Alert Report

This report is a summary of classififcation changes which became effective by issuance of Classification Orders in September - December 1989. Information includes:

- subclasses established or abolished
- subclass title, indent, or position change
- classes where existing subclass definitions have changed

A Reclassification Alert Report may appear from time to time in the Official Gazette, and is intended to provide an interim notice of classififcation changes pending publication of the Manual of Classification and revisions thereto.

January 10, 1990

WILLIAM S. LAWSON
Administrator for Documentation

CLASS	FIRST SUBCLASS	LAST SUBCLASS	ACTION	ORDER NUMBER
004			Defn Change	1314
008			Defn Change	1314
024			Defn Change	1314
030			Defn Change	1314
033	175	179	Abolish	1315
033	179.5		Abolish	1315
033	501.11	501.19	Establish	1315
033	501.45		Establish	1315
033	501.7	501.9	Establish	1315
033	514.1	514.2	Establish	1315
033	542.1		Position Change	1315
033	543.1		Establish	1315
033	544.1	544.6	Establish	1315
033	555.1	555.4	Establish	1315
033	561.1	561.3	Establish	1315
048	127.1		Establish	1317
048	127.3		Establish	1317
048	127.5		Establish	1317
048	127.7		Establish	1317
048	127.9		Establish	1317
048	196		Abolish	1317
048	198.1	198.3	Establish	1317
048	198.5	198.8	Establish	1317
112			Defn Change	1314
119			Defn Change	1314
123			Defn Change	1317
128			Defn Change	1315
128	092		Abolish	1314
128	303	361	Abolish	1314
175			Defn Change	1314
206			Defn Change	1314
209			Defn Change	1315
219			Defn Change	1314
223			Defn Change	1314
227	175	182	Establish	1314
227	901	902	Establish	1314
227	D001		Abolish	1314
250			Defn Change	1314
252			Defn Change	1317
294			Defn Change	1314
328			Defn Change	1314
362			Defn Change	1314
378			Defn Change	1314
407			Defn Change	1314
428			Defn Change	1314
433			Defn Change	1314
435	068	071	Abolish	1316
435	068.1		Establish	1316
435	069.1	069.5	Establish	1316
435	069.51	069.52	Establish	1316
435	070.1	070.2	Establish	1316
435	070.21		Establish	1316
435	070.3	070.5	Establish	1316
435	071.1	071.3	Establish	1316
530			Defn Change	1316
604			Defn Change	1314
606	001	236	Establish	1314
623			Defn Change	1314
935			Defn Change	1316

PATENT NOTICES

Certificates of Correction For Week of February 6, 1990

D. 301,531	4,802,635	4,822,367	4,832,245
RE. 32,666	4,802,986	4,823,012	4,832,626
4,135,622	4,803,129	4,824,117	4,832,658
4,571,625	4,803,535	4,824,519	4,832,727
4,626,443	4,803,968	4,825,532	4,832,823
4,667,018	4,804,253	4,825,936	4,833,019
4,669,119	4,804,443	4,826,609	4,833,179
4,670,720	4,804,519	4,826,744	4,833,318
4,672,262	4,804,671	4,826,769	4,833,334
4,677,617	4,806,556	4,826,819	4,833,380
4,707,076	4,807,148	4,826,991	4,833,911
4,708,735	4,807,832	4,827,501	4,833,924
4,725,652	4,808,127	4,827,899	4,833,998
4,736,056	4,809,545	4,828,030	4,834,978
4,740,391	4,809,903	4,828,031	4,835,199
4,747,079	4,810,783	4,828,539	4,835,473
4,763,889	4,810,821	4,828,895	4,835,559
4,768,737	4,812,265	4,829,016	4,835,926
4,769,963	4,812,822	4,829,594	4,836,249
4,784,201	4,815,013	4,829,743	4,836,726
4,784,852	4,815,166	4,829,863	4,836,836
4,788,709	4,815,963	4,830,069	4,837,207
4,790,442	4,816,278	4,830,580	4,837,559
4,791,990	4,816,463	4,830,618	4,837,855
4,792,609	4,818,586	4,830,664	4,837,946
4,794,297	4,820,360	4,830,698	4,838,039
4,794,423	4,820,519	4,830,914	4,838,148
4,795,422	4,820,701	4,831,209	4,838,518
4,799,162	4,820,983	4,831,715	4,838,743
4,799,717	4,821,727	4,831,744	4,839,186
4,800,362	4,821,764	4,831,807	4,839,675
4,800,795	4,821,961	4,831,819	4,840,704
4,800,869	4,822,043	4,831,948	4,865,213

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Since there are variations in the scope of patent collections among the PDLs and in their hours of service to the public, anyone contemplating use of the patents at a particular library is urged to contact that library, in advance, about its collection and hours in order to avert possible inconvenience.

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	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

JAMES E. DENNY, Acting Assistant Commissioner
STEPHEN G. KUNIN, Acting Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF December 30, 1989

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	5-26-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director	6-16-87
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. V. FISHER, Acting Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	3-21-88
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	1-28-87
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—D. G. Kelly, Director	10-15-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	2-27-87
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. GOLDBERG, Director	1-13-88
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX,Director	6-28-88
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	12-24-87
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260 STEWART LEVY, Acting Director	11-17-87
DESIGN, GROUP 290—K. L. CAGE, Director	2-6-86
MECHANICAL EXAMINING GROUPS	
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SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—C. CROYLE, Acting Director	2-26-88
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-2-89

Expiration of patents: The patents within the range of numbers indicated below expire during December 1989, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,704,469 to 3,707,728 inclusive
Plant Patents ..... 3262 to 3280 inclusive

REEXAMINATIONS

FEBRUARY 6, 1990

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,956,327 (1202nd)
METHOD OF PREPARING 2,4-DIAMINO-5-BENZYL PYRIMIDINES

Ronald M. Cresswell, Scarsdale; John W. Mentha, Hartsdale, and Russell L. Seaman, Chappaqua, all of N.Y., assignors to Burroughs Wellcome Co., Triangle Park, N.C.

Reexamination Request No. 90/001,720, Feb. 23, 1989.

Reexamination Certificate for Patent No. 3,956,327, issued May 11, 1976, Ser. No. 482,144, Jun. 24, 1974.

Continuation of Ser. No. 258,804, Jun. 1, 1972, abandoned, which is a division of Ser. No. 16,606, Mar. 4, 1970, Pat. No. 3,697,512.

Claims priority, application United Kingdom, Mar. 6, 1969, 11908/69; Mar. 6, 1969, 11909/69; May 16, 1969, 25171/69; Jun. 13, 1969, 30247/69

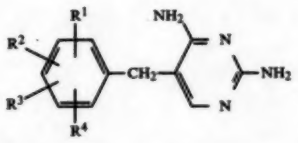
Int. Cl.[4] C07D *239/49*

U.S. Cl. 544—325

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

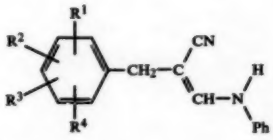
The patentability of claims 1–12 is confirmed.

1. A method of preparing a compound of formula I



(I)

which comprises the step of heating a mixture of a compound



and guanidine, where Ph is phenyl, naphthyl or phenyl substituted in one, two or three positions with lower alkyl, lower alkoxyl or halogen wherein lower alkyl and lower alkoxyl have 1 to 4 carbons and wherein R^1, R^2, R^3 and R^4 are the same or different, and each is hydrogen, halogen, lower alkyl of 1 to 4 carbon atoms, lower alkoxy of 1 to 4 carbon atoms or benzyloxy, or R^3 and R^4 taken together may be methylenedioxy when both R^1 and R^2 are hydrogen.

B1 4,575,826 (1204th)
REFRESH GENERATOR SYSTEM FOR A DYNAMIC MEMORY

Mark E. Dean, Boynton Beach, Fla., assignor to IBM Corp., Armonk, N.Y.

Reexamination Request No. 90/001,810, Jul. 17, 1989.

Reexamination Certificate for Patent No. 4,575,826, issued Mar. 11, 1986, Ser. No. 584,032, Feb. 27, 1984.

Int. Cl.[4] G11C *7/00*; G06F *13/00*

U.S. Cl. 365—222

AS A RESULT OF REEXAMINATION IT HAS BEEN DETERMINED THAT:

The patentability of claims 1 to 10 is confirmed.

New claims 11, 12 and 13 are added and determined to be patentable.

1. A refresh generator system for a dynamic random access memory in a data processing system which includes a processor of the type which, in response to a hold request signal, relinquishes control of its local bus and generates a hold acknowledge signal, said refresh generator system comprising first logic means responsive to a periodic signal from a refresh timer circuit to generate a hold request signal for the processor, second logic means responsive to a hold acknowledge signal from the processor to generate a refresh control signal, third logic means responsive to the refresh control signal to provide a refresh signal to control memory row access, a counter circuit coupled to be incremented by one in response to each refresh control signal, and a sequencer circuit responsive to each refresh control signal to generate a first gating signal to gate the current count in the counter circuit, representing a memory row address, to the memory and thereafter to generate a second gating signal to generate a memory read signal.

B1 4,728,471 (1205th)
TREATMENT OF EXPANSIBLE MATERIALS TO FORM LIGHTWEIGHT AGGREGATE

Robin A. Kyffin, Porthmadog, Wales; Peter A. Young, Harrogate, and Allon C. Day, Low Worsall, both of England, assignors to J. W. Greaves & Sons Limited, North Wales, United Kingdom

Reexamination Request No. 90/001,749, Apr. 11, 1989.

Reexamination Certificate for Patent No. 4,728,471, issued Mar. 1, 1988, Ser. No. 932,885, Nov. 20, 1986.

Claims priority, application United Kingdom, Nov. 23, 1985, 8528902

Int. Cl.[4] E29C *27/60*

U.S. Cl. 264—43

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim 8 is cancelled.

Claim 1 is determined to be patentable as amended.

Claims 2–7, dependent on an amended claim, are determined to be patentable.

1. A method of heat-treating expansible particular materials to expand the same and produce a lightweight granular product comprising: precluding adherence of at least partially fused particles of said material to each other and the lining of a kiln

by [,] providing a moving hearth within said kiln, feeding said material to said moving hearth at a charging zone so as to be distributed [over] *across substantially the entire radial extent of* said hearth and moving the hearth successively through a treatment zone of elevated temperature sufficient to at least partially fuse and expand said material [and], thereafter [,] *through* a discharge zone, at which the resultant expanded product is discharged from said hearth, *and finally through a pre-heating zone where said hearth is heated to said elevated temperature before receiving further material at said charging zone.*

STATUTORY INVENTION REGISTRATIONS

PUBLISHED FEBRUARY 6, 1990

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

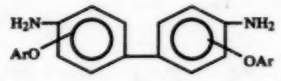
H728

ARYLOXY P-BENZIDINE COMPOUNDS

J. Shield Wallace, Albuquerque, N. Mex., and Fred E. Arnold, Centerville, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 26, 1988, Ser. No. 249,621
Int. Cl.[4] C07C *87/50*
U.S. Cl. 564—309 6 Claims

1. A substituted p-benzidine of the formula



wherein Ar is phenyl or phenoxy phenyl.

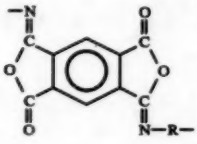
H729

AROMATIC POLYISOIMIDES

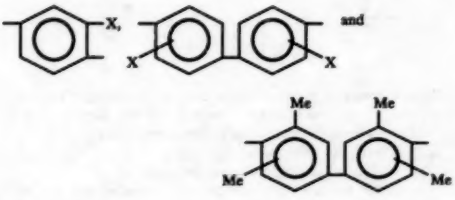
J. Shield Wallace, Albuquerque, N. Mex., and Fred E. Arnold, Centerville, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 26, 1988, Ser. No. 249,613
Int. Cl.[4] C08G *73/10*
U.S. Cl. 528—342 8 Claims

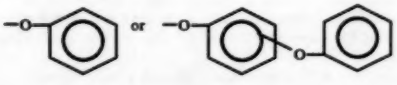
1. A polyisoimide having repeating units of the formula



wherein R is selected from the group consisting of



wherein Me is —CH_3 and wherein X is



H730

HYDROXY-TERMINATED COPOLYFORMALS OF FLUORODIOLS WITH NITRODIOLS

Lori A. Nock, Baltimore, and Horst G. Adolph, Burtonsville, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 2, 1989, Ser. No. 389,211
Int. Cl.[4] C08G *2/18*
U.S. Cl. 528—244 10 Claims

1. A dihydroxy-terminated copolyformal formed from

A. formaldehyde and

B. a diol comonomer mixture of

(1) a fluorodiol selected from the group consisting of
$HOCH_2CF_2CF_2CF_2CH_2OH$,
$HOCH_2CF_2CF_2CF_2CF_2CH_2OH$,
$HOCH_2CF(CF_3)OCF_2CF_2CF_2CH_2OH$,
$HOCH_2CF_2OCF_2CF_2OCF_2CH_2OH$,
$HOCH_2CH_2(CF_2)_2CH_2CH_2OH$,
$HOCH_2CH_2(CF_2)_4CH_2CH_2OH$,
$HOCH_2CH_2(CF_2)_6CH_2CH_2OH$,
$HOCH_2CH_2(CF_2)_8CH_2CH_2OH$,
$HOCH_2CH_2(CF_2)_{10}CH_2CH_2OH$,
and mixtures thereof, and

(2) a nitrodiol selected from the group consisting of
$HOCH_2CH_2N(NO_2)CH_2CH_2N(NO_2)CH_2CH_2OH$,
$HOCH_2CH_2N(NO_2)CH_2C(NO_2)_2CH_2N(NO_2)CH_2CH_2OH$,
$HOCH_2C(NO_2)_2CH_2OCH_2OCH_2C(NO_2)_2CH_2OH$,
$HOCH_2CH_2N(NO_2CH_2C(NO_2)_2CH_2OCH_2OCH_2C(NO_2)_2CH_2N(NO_2)CH_2CH_2OH$, and
mixtures thereof,

wherein the fluorodiol comprises from about 10 to about 90 mole percent of the diol comonomer mixture with the nitrodiol being the remainder, and

wherein the terminal functional groups of the copolyformal are hydroxy groups.

H731

BLENDS OF THERMOPLASTIC POLYMERS AND MODIFIED BLOCK COPOLYMERS

William P. Gergen, 11311 Hylander St., Houston, Tex. 77007; Robert G. Lutz, 632 Vista Grande Pl., Santa Rosa, Calif. 95401; Carl L. Willis, 15922 Red Willow, Houston, Tex. 77084, and Lorelle A. Pottick, 727 Banker Hill Rd. #48, Houston, Tex. 77024

Continuation-in-part of Ser. No. 766,215, Aug. 16, 1985, Pat. No. 4,783,503, and a continuation-in-part of Ser. No. 766,216, Aug. 16, 1985, Pat. No. 4,797,447. This application Feb. 17, 1988, Ser. No. 157,353
Int. Cl.[4] C08L *53/00, 51/00*
U.S. Cl. 525—92 26 Claims

1. A multiphase polymer composition comprising:

(a) one phase containing at least be thermoplastic polymer containing a primary or secondary amine; and

(b) at least one other phase containing at least one composition to which has been grafted an effective amount of amide functional groups for toughening said multi-phase polymer compositions, said compositions comprising:

(1) a selectively hydrogenated block copolymer which comprises

(i) at least one polymer block A, said A block prior to hydrogenated being at least predominately a polymerized alkenyl arene block, and

(ii) at least one hydrogenated polymer block B, said B block prior to hydrogenation being at least predominately a polymerized conjugated diene block, and

(2) wherein substantially all of said amide functional groups are grafted to said block copolymer on said A blocks, and

(3) wherein said amide functional groups are represented by the general formula

wherein R is an alkyl, cycloalkyl, or aryl radical, and

(c) said one phase (a) being present in a weight ratio of about 99: to about 1:99 relative to said at least one other phase (b).

H732

POLYMER BLEND

Robert G. Lutz, Santa Rosa, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 20, 1988, Ser. No. 208,691
Int. Cl.[4] C08F *283/00*; C08G *14/00*
U.S. Cl. 525—471 5 Claims

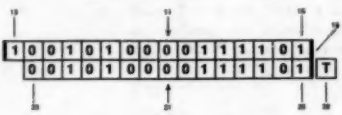
1. A composition comprising a non-miscible blend of, as a major component, a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon and, as a minor component as oligomer derived from spihalohydrin and a hydroxyphenylalkane.

H733

EDUCATIONAL DEVICE FOR DEMONSTRATING NONSTANDARD COUNTING PROCEDURES

Jan C. West, Alliance, Ohio, assignor to The United States of America as represented by the President of the United States, Washington, D.C.

Filed Jun. 3, 1988, Ser. No. 211,981
Int. Cl.[4] G09B *19/02*
U.S. Cl. 434—189 7 Claims



1. An educational device for extending sequences comprising;

a first platen accomodating a row of a plurality of first plates secured together and inscribed with a challenge numerical sequence;

a second platen accomodating a row of a plurality of second plates secured together and inscribed with a challenge numerical sub-sequence;

said first and second platens being secured together to function as a unit, with said second platen being offset to the right with respect to said first platen by one digit position of said sequence;

and a third plate positioned to the right of said second platen, said third plate serving as a means of preparing for the continuation of said challenge numerical sub-sequence.

H734

METHOD FOR INHIBITING ONSET OF OR TREATING MIGRAINE HEADACHES EMPLOYING AN ACE INHIBITOR

Abraham Sudilovsky, Lawrenceville, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 118,131, Nov. 9, 1987, abandoned. This application Mar. 7, 1988, Ser. No. 164,689
Int. Cl.[4] A61K *37/00*, *31/44*
U.S. Cl. 514—19 16 Claims

1. A method for inhibiting onset or treating migraine headache in a mammalian specie, which comprises administering to a mammalian specie in need of such treatment an effective amount of an angiotensin converting enzyme inhibitor alone or in combination with a calcium channel blocker over a prolonged period of treatment to reduce frequency and/or severity of migraine headaches during such period of treatment.

H735

LEAD-203 AS A LABEL FOR RADIOIMAGING

Suresh C. Srivastava, Setauket, and George E. Meinken, Middle Island, both of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 30, 1988, Ser. No. 175,424
Int. Cl.[4] A61K *43/00*
U.S. Cl. 424—1.1 7 Claims

1. A conjugate of Pb-203 and an antibody or an antibody fragment useful in radioimaging.

H736

PROCESS FOR MAKING BORON NITRIDE USING SODIUM CYANIDE AND BORON

Carlos E. Bamberger, Oak Ridge, Tenn., assignor to The United Stated of America as represented by the Department of Energy, Washington, D.C.

Filed Feb. 27, 1987, Ser. No. 19,835
Int. Cl.[4] C01G *21/64*
U.S. Cl. 423—290 6 Claims

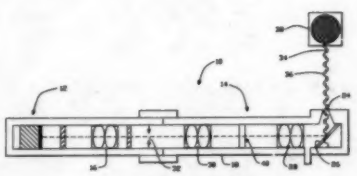
1. A process for making boron nitride comprising mixing sodium cyanide with boron phosphate and heating said mixture in a nonvacuum atmosphere of gas selected from the group nitrogen or an inert gas to a temperature and for a length of time suitable to cause reaction and subsequentialy extracting said by-products and unreacted starting material with water.

H737

LIGHT INTENSITY COMPRESSOR

Michael C. Rushford, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 18, 1988, Ser. No. 241,231
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—347 E 15 Claims



1. In a system in which a scene having a given light intensity profile is viewed, an assembly for compressing the light intensity range associated with that profile, comprising:

a light intensity compressor including,

a twisted nematic liquid crystal material,

means for applying an electric field having an intensity profile corresponding to the light intensity profile of said scene to a region of the liquid crystal material, and

a first and second polarizer, said polarizers being disposed on opposite sides of the liquid crystal material, the first and second polarizers and said liquid crystal material cooperating to compress the light intensity profile of the viewed scene;

means for forming an image of the scene being viewed on the light intensity compressor; and

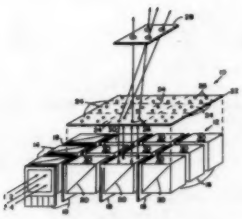
means for viewing a compressed image of the scene.

H738

SWITCHED HOLOGRAMS FOR RECONFIGURABLE OPTICAL INTERCONNECT

J. Barry McManus, Arlington; Roger S. Putnam, Newton, both of Mass., and H. John Caulfield, Cornersville, Tenn., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 17, 1989, Ser. No. 381,543
Int. Cl.[4] G02B 5/32; G02F 1/13
U.S. Cl. 350—3.7 3 Claims



1. A Holoswitch comprising a switch array of a multiplicity of optical switches, said optical switches each including a liquid crystal cell and a polarizing beamsplitter, said switch array of said multiplicity of switches having said multiplicity of switches arranged for receiving a plurality of parallel optical beams and for directing the beams as a set toward a selected row of several rows formed by switches of said switch array, each switch of said several rows of said switch array having an output face through which said optical parallel beams can be projected to holographic spots of a hologram plate located adjacent said output face, and said optical face further projecting said beams from the holographic spots to detector means.

H739

AUXILIARY ANTENNA INTERFERENCE CANCELLER

Frank S. Gutleber, Little Silver, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 13, 1989, Ser. No. 374,123
Int. Cl.[4] G01S 3/16
U.S. Cl. 342—384 10 Claims

1. An interference cancelling system, comprising:

primary receiving antenna means including an output for providing a first output signal including a desired signal and all interfering signals;

steerable auxiliary receiving antenna means including means for simultaneously forming and scanning a plurality of relatively narrow receiving beams respectively directed to a predetermined number of individual sources of interfering signals for providing a respective number of second output signals; and

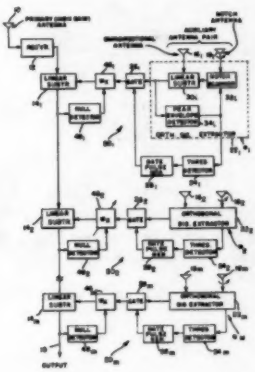
means connected to the output of said primary antenna means and said auxiliary antenna means for subtracting said second output signals from said first output signal.

H740

ANTENNA SIDELOBE INTERFERENCE CANCELLER

Frank S. Gutleber, Little Silver, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 13, 1989, Ser. No. 374,124
Int. Cl.[4] G01S 3/16
U.S. Cl. 342—384 15 Claims



1. An antenna sidelobe interference cancelling system, comprising:

primary receiving antenna means including an output for providing a first output signal including a desired signal and all of a plurality of interfering signals;

at least one auxiliary receiving antenna pair including omindirectional antenna means and steerable notch antenna means, said notch antenna means including a notch in the radiation pattern thereof directed to one of said interfering signals;

first circuit means connected to the respective outputs of said auxiliary antenna pair and differencing the output signals generated thereby to generate a second output signal corresponding to said one interfering signal; and

second circuit means connected to the output of said primary antenna means and said first circuit means for subtracting said second output signal from said first output signal and generating a control output signal.

H741

DISCRETE COMPLEX CORRELATION DEVICE FOR OBTAINING SUBPIXEL ACCURACY

Norman F. Powell, Ellicott City, Md., and Glora A. Bendor, Columbia, Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 12, 1984, Ser. No. 643,904
Int. Cl.[4] G01S 13/90
U.S. Cl. 342—25 8 Claims

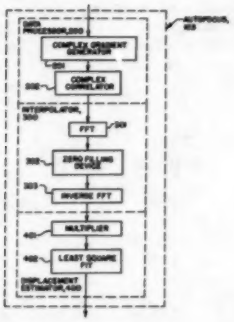
1. An autofocus device in combination with a synthetic aperture radar system to extract error phase from detected data, said autofocus device comprising:

a complex gradient generator receiving said detected data from said synthetic aperture radar system and generating a complex gradient from said detected data;

a complex correlator receiving said complex gradient from said complex gradient generator and outputting a line per line complex correlation;

an interpolator receiving said complex correlation from said

complex correlator and performing an interpolation to obtain a shift estimate; and



a displacement estimator receiving said shift estimate from said interpolator and converting said shift estimate into said error phase.

H742

TWO-LINE PHASE-MATCHED RAMAN AMPLIFIER

Bradley L. Bobbs, Granada Hills, and Jeffrey A. Goldstone, Newbury Park, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 14, 1988, Ser. No. 286,029
Int. Cl.[4] H01S *3/00*; H03F *7/00*
U.S. Cl. 330—4.3 5 Claims

1. A method for a Raman amplifier having a pump laser with two spectral lines used as input beams, and a Raman medium in which Raman gains of two lines in Stokes-shifted output are coupled together by a four-wave mixing process, said method comprising adjusting the angles between the input beams, so that the four-wave mixing phase mismatch due to medium dispersion is substantially eliminated;

whereby the Raman gains of the two Stokes shifted lines are coupled together so that the effective pump intensity for each is the total pump intensity: and since both lines convert in about the same amplifer length, independent of the relative power in each, the conversion efficiency is not limited by the inability to optimize the length for both lines simultaneously.

H743

LOW CURRENT VOLTAGE REFERENCE

Otto H. Bismark, Fords, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 13, 1989, Ser. No. 406,929
Int. Cl.[4] G05F *3/16*
U.S. Cl. 323—313 12 Claims

1. A voltage reference circuit comprising:

a voltage source;

a first circuit connected to the voltage source having a positive temperature coefficient, and including means for generating a reference voltage that is substantially independent of the voltage source over a predetermined voltage range; and

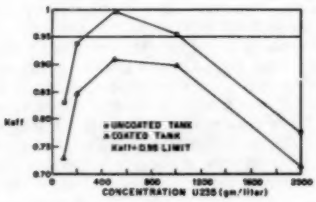
a negative temperature coefficient device connected in series with the first circuit.

H744

PORCELAIN ENAMEL NEUTRON ABSORBING MATERIAL

Daniel C. Iverson, Aiken, S.C., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Nov. 20, 1987, Ser. No. 123,462
Int. Cl.[4] C04B *35/68*; G21C *5/12*
U.S. Cl. 252—478 7 Claims



1. A neutron absorbing composite comprising a porcelain enamel coating adhered to a chemical reaction vessel containing a process stream of fissile material, said coating consisting essentially, by weight, of a major proportion of oxide of a cadmium compound and minor proportions of oxides of a boron compound, a lithium compound, and a silicon compound in the form of a porcelain enamel coating, said coating applied to said vessel in a thickness sufficient to prevent criticality.

H745

ION-SELECTIVE ELECTRODE FOR MEASURING CARBONATE CONCENTRATION

Kimiko Ishizuka and Osamu Seshimoto, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 17, 1988, Ser. No. 169,288
Claims priority, application Japan, Mar. 17, 1987, 62-61889
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—418 2 Claims

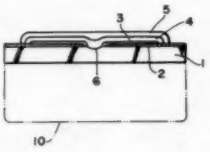
1. An ion-selective electrode for measuring carbonate concentration comprising layers in the following order:

an electrically insulating support;

a conductive metal layer on said support;

a metal halide of said same conductive metal on said metal layer;

a carbonate ion-selective layer containing an ion carrier; and



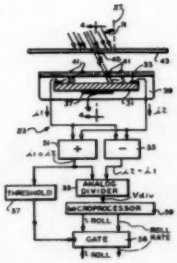
a buffer layer of a hydrophilic polymer binder containing a buffer.

H746

SOLAR REFERENCE FLIGHT ROLL POSITION SENSOR

Robert K. Leach, Minneapolis, Minn., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 11, 1989, Ser. No. 393,174
Int. Cl.[4] G01C *21/00, 1/00*
U.S. Cl. 73—178 R 20 Claims



1. A flight position sensor comprising:

a photodetector having means for generating first and second currents in response to the position of a beam of solar radiation illuminating a portion of a surface of the photodetector;

an opaque screen having an aperture therein superimposed above the surface of the photodetector such that a different portion of the surface is illuminated by solar radiation passing through the aperture for different positions of the sensor with respect to the sun; and

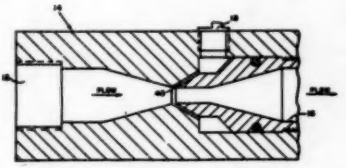
means for measuring the relative values of the first and second currents whereby the position of the sensor with respect to the sun is determined.

H747

ACTIVE CONTROL OF SOLID PROPELLANT GENERATORS USING THROAT MODULATION TECHNIQUES AND PROGRAMMABLE COMPENSATION

Paul L. Jacobs, Huntsville, and J. C. Dunaway, Falkville, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 1, 1982, Ser. No. 383,403
Int. Cl.[4] F02K *1/18*
U.S. Cl. 60—242 4 Claims



1. A system for controlling the gas flow rate of a solid propellant comprising a solid propellant gas generator connected to a throat modulation device and thrust nozzle that has an exhaust outlet, a pressure sensor mounted on said solid propellant gas generator and being connected from said pressure sensor to a microprocessor controller for transmitting the chamber pressure of the solid propellant gas to the microprocessor controller, a temperature sensor mounted on said solid propellant gas generator and innerconnecting means connecting said temperature sensor to said microprocessor controller for transmitting said sensed temperatures of said solid propellant gas generator to said microprocessor controller, said microprocessor controller processing said sensed pressures and said sensed temperatures of said solid propellant gas generator and producing control signals, means innerconnecting said microprocessor controller to a modulation control valve, said modulation control valve being connected to a source and said control signals being utilized to control said modulation control valve in such a manner to produce a modulated output from said modulation control valve that is communicated to said throat modulation device and thrust nozzle to cause the thrust produced at the outlet of said throat modulation device and thrust nozzle to be controlled in accordance with the sensed temperature and pressure of said solid propellant gas generator.

REISSUES

FEBRUARY 6, 1990

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,158

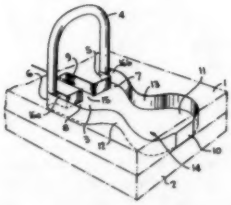
FLUIDIC OSCILLATOR WITH RESONANT INERTANCE AND DYNAMIC COMPLIANCE CIRCUIT

Ronald D. Stouffer, Silver Spring, and Peter Bauer, Germantown, both of Md., assignors to Bowles Fluidics Corporation, Columbia, Md.

Original No. 4,231,519, dated Nov. 4, 1980, Ser. No. 19,250, Mar. 9, 1979. Application for reissue Mar. 19, 1985, Ser. No. 713,716

Int. Cl.[4] B05B *1/08, 1/34;* F15C *1/22*

U.S. Cl. 239—589.1 **5 Claims**



1. A fluidic oscillator having a chamber, an inlet opening for issuing a jet of working fluid into said chamber, and an outlet opening for issuing working fluid from said chamber into the ambient environment, characterized by a fluid inertance flow conduit transferring working fluid between first and second locations on opposite sides of said jet and near said inlet opening in said chamber, and a dynamic compliance in the form of a vortex region defined between sidewalls of said chamber which generally converge towards said outlet opening and near said outlet opening such that working fluid in the jet forms in said vortex region a vortex which alternately flows in opposite directions, the vortex alternately aspirating fluid from and supplying fluid to said first and second locations in opposite phase and thereby through said inertance in alternately opposite directions.

Re. 33,159

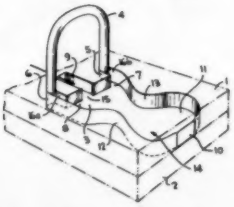
FLUIDIC OSCILLATOR WITH RESONANT INERTANCE AND DYNAMIC COMPLIANCE CIRCUIT

Peter Bauer, 13921 Esworthy Rd., Germantown, Md. 20767

Original No. 4,231,519, dated Nov. 4, 1980, Ser. No. 19,,250, Mar. 9, 1979. Application for reissue Jun. 10, 1983, Ser. No. 503,119

Int. Cl.[4] B05B *1/08, 1/34;* F15C *1/22*

U.S. Cl. 239—589.1 **37 Claims**



41. A fluidic spray device comprising:

a chamber having sidewalls forming an upstream end and a downstream end thereof;

fluid inlet means;

inlet means for issuing a jet of working fluid into aid chamber;

said sidewalls in the upstream end of said chamber converging toward said jet and substantially spaced therefrom;

said inertance means including an inertance flow conduit having an entry portion thereof entering directly into said upstream end of said chamber so that working fluid from said inertance means enters directly into said upstream end of said chamber at a location substantially spaced from said jet;

outlet means for issuing working fluid from said chamber in a flow pattern and direction determined by the static pressure and flow velocity of working fluid in said chamber;

dynamic compliance means including sidewalls which converge toward said outlet opening and near said outlet opening for establishing a vortical flow of the working flow issued into said chamber; and

fluid inertance means for cyclically reversing said vortical flow between first and second flow directions, said fluid inertance means interconnecting first and second locations in said chamber on opposite sides of said jet proximate said inlet means such that vortical flow in said first flow direction aspirates fluid from said fluid inertance means at said first location and feeds fluid into said fluid inertance means at said second location, and such that vortical flow in said second direction aspirates fluid from said fluid inertance means at said second locations and feeds fluid into said fluid inertance means at said first location, said fluid inertance means including means establishing a flow inertia for delaying changes in flow conditions through said fluid inertance means in response to differential pressure changes across said first and second locations.

Re. 33,160

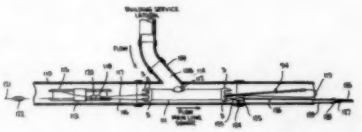
METHOD AND APPARATUS FOR INSPECTING LATERAL LINES

Kenneth R. Guthrie, Orlando, Fla., and James R. Martin, Orangevale, Calif., assignors to Cues, Inc., Orlando, Fla.

Original No. 4,651,558, dated Mar. 24, 1987, Ser. No. 776,163, Sep. 13, 1985. Application for reissue Nov. 25, 1987, Ser. No. 125,578

Int. Cl.[4] H04N *7/18*

U.S. Cl. 73—40.5 R **29 Claims**



21. Apparatus for inspecting a building service lateral sewer pipeline from a lateral opening in a main sewer pipeline at which the lateral and main pipelines intersect, said apparatus comprising:

a lateral television camera of sufficiently small size to fit in said lateral pipeline;

a lateral signal conduction cable connected to said lateral camera from a remote location for delivering electrical signals required to operate the lateral camera and sending a lateral video signal representing an image viewed by the lateral camera;

an elongated flexible push rod having a first end secured to said lateral camera and a second end, said push rod having suffi-

cient longitudinally compressive rigidity to push said lateral camera along said lateral pipeline when moved longitudinally into said lateral pipeline from said lateral opening, and sufficient transverse flexibility to follow bends in said lateral pipeline when moved longitudinally therein; and

means for selectively extending said push rod and said lateral camera along with said lateral cable into, and retracting said lateral camera and said push rod along with said lateral cable from, said lateral pipeline via said lateral opening.

Re. 33,161

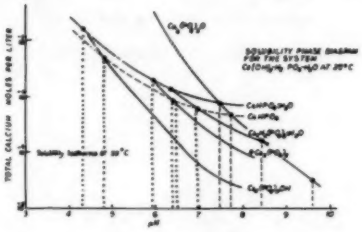
COMBINATIONS OF SPARINGLY SOLUBLE CALCIUM PHOSPHATES IN SLURRIES AND PASTES AS MINERALIZERS AND CEMENTS

Walter E. Brown, Rockville, and Laurence C. Chow, Potomac, both of Md., assignors to American Dental Association Health Foundation, Gaithersburg, Md.

Original No. 4,612,053, dated Sep. 16, 1986, Ser. No. 732,515, May 9, 1985. Continuation-in-part of Ser. No. 539,740, Oct. 6, 1983, Pat. No. 4,518,430, which is a continuation-in-part of Ser. No. 373,157, Apr. 29, 1982, abandoned. Application for reissue Mar. 2, 1988, Ser. No. 163,014

Int. Cl.[4] C01B *25/32*; A61K *6/00*

U.S. Cl. 423—308 **52 Claims**



1. A [dental restorative] slurry [comprising] *consisting essentially of* an aqueous mixture of $Ca_4(PO_4)_2O$ and at least one other calcium phosphate selected from the group consisting of $CaHPO_4.2H_2O$[,] *and* $CaHPO_4$, [$Ca_8H_2(PO_4)_6.5H_2O$, α—$Ca_3(PO_4)_2$, β—$Ca_3(PO_4)_2$, and modified $Ca_3(PO_4)_2$,] both calcium phosphates being present in the slurry in excess such that hydroxyapatite is substantially continuously precipitated from the slurry *at an ambient temperature.*

PLANT PATENTS

GRANTED FEBRUARY 6, 1990

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,136

ROSE PLANT — LAVGLO VARIETY

Keith Laver, Caledon East, Canada, assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Nov. 28, 1988, Ser. No. 276,862
Int. Cl.[4] A01 *5/00*
U.S. Cl. Plt.—8 1 Claim

1. A new and distinct variety of Miniature rose plant characterized by the following combination of characteristics:

(a) forms in abundance on a continuous basis attractive long lasting double yellow blossoms of good color stability,

(b) exhibits a low, compact and well-branched growth habit, and

(c) is well suited for pot forcing;

substantially as herein shown and described, together with the parts thereof.

7,137

ROSE PLANT — OLIJCHOU VARIETY

Huibert W. Olij, De Kwakel, Netherlands, assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Jan. 25, 1989, Ser. No. 301,109
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—15 1 Claim

1. A new and distinct variety of Intermediate rose plant characterized by the following combination of characteristics:

(a) forms in abundance attractive long lasting semi-double lemon yellow blossoms which are suffused with marigold orange on the edges,

(b) is well adapted for greenhouse forcing,

(c) exhibits vigorous vegetation, and

(d) is particularly suited for cut flower production;

substantially as herein shown and described.

7,138

ROSE PLANT — KEIROMO VARIETY

Seizo Suzuki, Tokyo, Japan, assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Jan. 23, 1989, Ser. No. 299,679
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—18 1 Claim

1. A new and distinct variety of Hybrid Tea rose plant characterized by the following combination of characteristics:

(a) forms in abundance elegant long lasting blossoms which are scarlet pink on the inside and light carmine rose on the outside,

(b) is well adapted for forcing,

(c) exhibits vigorous glossy vegetation, and

(d) is particularly suited for cut flower production;

substantially as herein shown and described.

7,139

ROSE PLANT—KIBOH VARIETY

Seizo Suzuki, Tokyo, Japan, assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Jan. 23, 1989, Ser. No. 299,678
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—22 1 Claim

1. A new and distinct variety of Floribunda rose plant characterized by the following combination of characteristics:

(a) forms attractive long lasting bipolar very double blossoms which are strawberry red with a lemon yellow base on the inside and are lemon yellow tinted with turkey red on the outside,

(b) is particularly well suited for the decoration of parks and gardens, and

(c) exhibits a vigorous bushy growth habit;

substantially as herein shown and described.

7,140

VARIETY OF TROPICAL MANGO NAMED MARTY

Neal P. Brooks, P.O. Drawer 9, 18400 SW. 256 St., Homestead, Fla. 33090

Filed Feb. 12, 1988, Ser. No. 155,479
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—33 1 Claim

1. A new and distinct variety of tropical mango substantially as described and illustrated having a fruit characterized by a dark purplish red skin color.

7,141

VARIETY OF TROPICAL MANGO NAMED ED MITCHELL

Edward F. Mitchell, 13950 SW. 67 Ave., Miami, Fla. 33158

Filed Feb. 12, 1988, Ser. No. 155,477
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—33 1 Claim

1. A new and distinct variety of tropical mango substantially as described and illustrated having a fruit characterized by a bright green underside with blended shades of yellow and peach on most of the surface of the fruit.

7,142

MALUS CORAL CASCADE

Henry A. Ross, 16711 Pearl Rd., Strongsville, Ohio 44136

Filed Dec. 30, 1988, Ser. No. 292,113
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—34 1 Claim

1. A new and distinctive variety of flowering crabapple tree, as described and illustrated, a clone which is especially distinctive because of its wide-spreading, cascading habit of growth, especially when loaded with fruit in the Fall; an extremely profuse and striking annual display of persistant, small, glossy fruit of an unusual and uncommon coral-orange coloration; as well as being easily propagated vegetatively and coming true to the original selection, fairly rapid growing and apparently free from diseases which normally affect flowering crabapples.

7,143

AFRICAN VIOLET PLANT IMPROVED MONIQUE

Reinhold Holtkamp, Sr., Werther Strasse 112, D4294 Isselburg, Fed. Rep. of Germany

Filed Feb. 15, 1989, Ser. No. 310,755
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—69 1 Claim

1. An new and distinct cultivar of African violet named Improved Monique, as described and illustrated, and particularly characterized by its single, occasionally semi-double, dark lilac flowers with darker center radiating into the two small petals; frilled edges, strong, upright flower stems that curve toward the center to form a compact bouquet above the leaves; medium green, serrated, oval leaves; profuse flowering, vigorous growth habit, flowering 10–11 weeks after potting, and is long-lasting and non-dropping flowers.

7,144

CARNATION NAMED HILSUCCES

Jan J. Hilverda, Aalsmeer, Netherlands, assignor to Hilverda b.v., Aalsmeer, Netherlands

Filed Jan. 23, 1989, Ser. No. 299,771
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—71 1 Claim

1. The new and distinct spray carnation cultivar, substantially as herein shown and described, characterized by its profuse production of relatively small flowers having a soft light pink coloration, borne singly on stems emitted in longitudinally-spaced relation on a long, flowering stem having an abundant production of foliage.

7,145

CARNATION NAMED KILLER

Antonio Di Giorgio, and Renato Di Giorgio, both of San Remo, Italy, assignors to Laboratoire de Physiologie Vegetale, La Londe-Le Maures, France

Filed Dec. 21, 1988, Ser. No. 294,517
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—73 1 Claim

1. The new and distinct carnation cultivar, substantially as herein shown and described, particularly distinguished by its profuse production of very large Turkish Red flowers borne singly on long, strong stems of a tall plant having a vigorous growth habit.

PATENTS

GRANTED FEB. 6, 1990

ERRATA

For CLASS	See PATENT NO.
074-594	4,898,063
074-594	4,898,064
475-179	4,898,065
081-483	4,898,068
073-118	4,898,084
606-114	4,898,155
606-072	4,898,156
606-147	4,898,157
606-105	4,898,161
606-042	4,898,169
606-236	4,898,171
606-062	4,898,186
440-001	4,898,563
528-323	4,898,896
313-594	4,899,092

PATENTS

GRANTED FEBRUARY 6, 1990

GENERAL AND MECHANICAL

4,897,885
ONE-PIECE INFANT BUNTING
Audrey T. Lunt, 6371 Vermont Hill Rd., South Wales, N.Y. 14139
Filed Mar. 17, 1989, Ser. No. 324,753
Int. Cl.[4] A41B *13/06*
U.S. Cl. 2—69.5 **7 Claims**

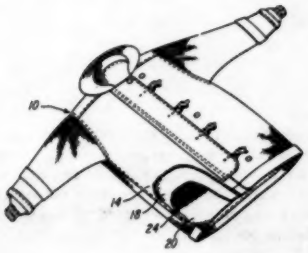
1. An infant bunting formed from a single die-cut blank of ultrasonically sealable fabric material, the blank being contoured to define a rectangular main section having opposing sides and provided with a lower extension forming a closure section and an upper extension whose corners are folded in and ultrasonically seamed at their abutting edges to form a triangular hood section, the opposing sides of the main section being folded over the infant's body, arms and legs in overlapping relation to form a pouch which is held together by at least one Velcro fastener having hook and loop components which are ultrasonically welded to the respective sides, the closure section being foldable over the pouch to lock in the feet of the infant and being held to the pouch by a Velcro fastener, one of whose components is ultrasonically welded to the closure section, the other to one of said sides, said fabric material having multiple layers including a core layer formed of thermal insulation and a band ultrasonically welded across the upper extension to seal the core layer to the other layers of the material and to define a living neck hinge.

4,897,886
FIREFIGHTER'S GARMENTS HAVING MINIMUM WEIGHT AND EXCELLENT PROTECTIVE QUALITIES
William L. Grilliot, and Mary I. Grilliot, both of 1986 Home Ave., Dayton, Ohio 45417
Filed Nov. 30, 1988, Ser. No. 278,553
Int. Cl.[4] A41D *1/02, 13/00*
U.S. Cl. 2—81 **22 Claims**

1. A firefighter's garment comprising an outer layer of flame resistant material, an intermediate layer of moisture resistant material, and an inner layer, spacer means positioned between the inner layer and the intermediate layer, the spacer means being enclosed between the inner layer and the intermediate layer whereby a dead air space is provided and circulation of air through the garment between the inner layer and the intermediate layer is prevented, the spacer means having a degree of rigidity, thereby maintaining a dead air space between the inner layer and the intermediate layer in all situations, including a situation in which localized external pressure is applied to the outer layer of the firefighter's garments, the air space thus consistently providing excellent thermal insulation while maintaining minimum weight.

13. A firefigher's garment comprising a plurality of layers of material, spacer means positioned between two of the layers of material and creating a dead air space between the two layers of material, the spacer means being enclosed between said two layers whereby circulation of air through the garment between the two layers is prevented, the spacer means comprising material having a degree of rigidity whereby the air space is maintained in all situations including situations in which localized external pressure is applied to the garment, the air space in the garment thus providing continuous and constant excellent thermal insulation qualities, and whereby the garment is light in weight.

20. The method of construction of a firefighter's garment comprising providing a plurality of layers of protective material, providing spacer means having a degree of rigidity, positioning the spacer means between two of the layers of material to provide dead air space between the two layers of material, enclosing the spacer-means between the two layers of material to prevent circulation of air through the garment and between the two layers of material, whereby the spacer means establishes and maintains air space between said two layers of materials even when localized external pressure is applied to the garment, the spacer means thus providing thermal insulation in the garment while permitting the garment to have minimum weight.

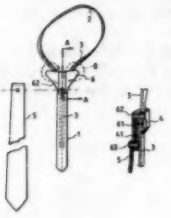


4,897,887
PREKNOTTED ADJUSTABLE NECKTIE
Jiaan-Jong Chen, and Ching-Hwa Chen, both of 21, Alley 21, Lane 244, Sec. 5, Yen-Ping North Road, Taipei, Taiwan
Filed Aug. 31, 1988, Ser. No. 238,731
Int. Cl.[4] A41D *25/02, 25/08*
U.S. Cl. 2—150 **8 Claims**

1. A preknotted adjustable necktie comprising an inner tie member which comprises a loop portion to surround a users neck in use and a portion depending from said loop portion, the junction between said loop portion and said depending portion incorporating a zip fastener having an adjustment slider whereby the size of the loop portion may be adjusted, a knot former comprising an inner body and an outer body connected together, with the inner tie member passing between the inner body and the outer body and the slider of the zip fastener fixed to the knot former, and an outer tie member fastened to said knot former, arranged as a knot over the knot former and

depending therefrom, such that the position of the knot former on the inner tie member may be varied to tighten and to loosen the loop portion.

7. A knot former for use in an adjustable preknotted necktie comprising an inner body and an outer body connectable together to form the knot former, the inner body comprising a pair of oppositely laterally directed wing portions and a de-



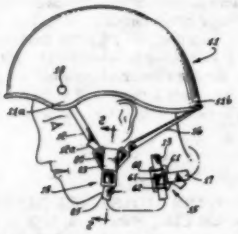
pending tongue portion spaced forwardly of the wing portion, the outer body comprising a corresponding pair of oppositely laterally directed wing portions and a downwardly extending slot on the front face of the outer body for receiving said tongue when the inner body is arranged with its wing portions behind said outer body and with said tongue passed over to the front of said outer body.

4,897,888

HELMET STRAP CLIP, AND ASSEMBLY

Lester V. Broersma, Bellflower, Calif., and Fritz W. Wurster, Waldstetten, Fed. Rep. of Germany, assignors to Bell Bicycles, Inc., Norwalk, Calif.

Filed Dec. 7, 1988, Ser. No. 280,821
Int. Cl.[4] A42B *3/00*
U.S. Cl. 2—421 **15 Claims**



1. For use with a helmet chin strap and forward and rearward straps connected to and depending from the helmet, a clip structure, comprising

(a) a first upright clip element having forward slot means connectible with the forward strap, and rearward slot means connectible with the rearward strap,

(b) a second upright clip element having lower slot means connectible with the chin strap,

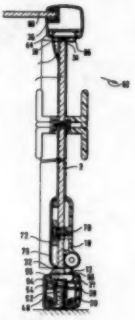
(c) the two elements having upper and lower pairs of interconnectible tongue and groove means whereby they are connectible together and disconnectible from one another in response to finger pressure exertion thereon.

4,897,889

SHOWER-PARTITION WITH PIVOTED DOOR

Heinz G. Baus, Hünibach-Thun, Switzerland, assignor to Altura Leiden Holding B.V., Maastricht, Netherlands

Filed Feb. 18, 1988, Ser. No. 156,737
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1987, 3705433
Int. Cl.[4] E06B *1/30*; A47K *17/00*
U.S. Cl. 4—607 **20 Claims**



1. A shower-partition comprising:

a door having a hinge edge and a free edge,

a stationary profiled rail;

a profiled compensating rail arranged on said stationary rail, said compensating rail comprising a partition forming the base of a longitudinal undercut groove open toward said hinge edge of said door;

at least two hinges having substantially aligned axes of rotation, each hinge comprising at least one hinge-mount having a base portion received in said undercut groove and secured to said compensating rail, said hinges pivotably mounting said door on said compensating rail; and

means for horizontally and vertically adjusting the position of said compensating rail and pivotably mounted door relative to said stationary rail comprising at least two connecting elements mounted in longitudinally spaced positions on said stationary rail and at least two adjusting screws with heads axially secured in longitudinally elongated slots in said compensating rail and threaded portions each received in a threaded hole in a respective one of said connecting elements.

4,897,890

AIR CONTROL SYSTEM FOR AIR BED

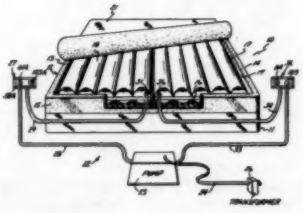
Robert A. Walker, 8700 W. 36th St., Minneapolis, Minn. 55426

Continuation of Ser. No. 455,664, Jan. 5, 1983, abandoned. This application May 2, 1986, Ser. No. 859,866
The portion of the term of this patent subsequent to May 16, 2006, has been disclaimed.
Int. Cl.[4] A47C *27/10*
U.S. Cl. 5—453 **20 Claims**

1. An apparatus for supplying air under pressure to an air mattress and regulating the pressure of the air in the air mattress comprising: pump means operable to supply air under pressure, electric powered means for operating the pump means, control means for controlling the electric power to the electric powered means and the flow of air from the pump means, hose means connecting the pump means with the control means and the control means with the air mattress for carrying air from the pump means to air mattress via the control means, said control means having first means operable to selectively allow air flow from the pump means through the control means to the air mattress and block the flow of air from the air mattress, switch means for connecting the electric

powered means to a source of electric power, said switch means being operated by the first means in response to movement of the first means to a position where the first means allows air to flow to the air mattress to connect the electric powered means to a source of electric power thereby operating the pump means, and second means separate from the first means operable to vent air from the air mattress thereby regulating the pressure of the air in the air mattress.

12. An apparatus for supplying fluid under pressure to means for accommodating fluid under pressure comprising: pump means operable to supply fluid under pressure, power means for operating the pump means, control means for controlling the power means and flow of fluid from the pump means to the



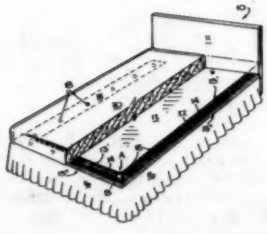
means for accommodating fluid under pressure, said control means having first means movable to a first position to allow flow of fluid from the pump means to the control means and then to the means for accommodating fluid under pressure and to a second position to block the flow of fluid from the means for accommodating fluid under pressure, and switch means operated by the first means when the first means is in the first position to connect the power means to a source of power thereby operating the pump means when the first means allows fluid to flow from the pump means to the means for accommodating fluid, and second means separate from the first means operable to allow fluid to flow from the means for accommodating fluid under pressure.

4,897,891

DUST RUFFLES FOR A BED WITH AN IMPROVED FASTENER SYSTEM

Robert A. Kallman, 14 Passaic Ave., Apt. 3B, Nutley, N.J. 07110, and Mark Henderson, 8 School Ave., Chatham, N.J. 07928

Continuation-in-part of Ser. No. 114,628, Oct. 28, 1987, Pat. No. 4,796,317. This application Oct. 21, 1988, Ser. No. 261,028
The portion of the term of this patent subsequent to Jan. 10, 2006, has been disclaimed.
Int. Cl.[4] A47G *9/04*
U.S. Cl. 5—493 **15 Claims**



1. A valance for a bed, comprising:

a ruffled portion; and,

an unruffled portion attached to said ruffled portion, said unruffled portion comprising a flexible mesh material in combination with fastener means adapted to penetrate the apertures of said flexible mesh material to thereby fasten said valance to portions of said bed, said fastener means including:

a top surface layer of a substantially rigid material; and,

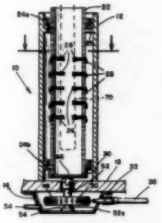
a head attached to said top surface layer, said head being capable of penetrating the apertures of said flexible mesh material to fasten said valance to portions of said bed.

4,897,892

GOLF CLUB GRIP CLEANER

James K. Bubien, 2505 Elizabeth Dr., Helena, Ala. 35080

Filed Jan. 9, 1989, Ser. No. 294,653
Int. Cl.[4] A63B *57/00*; A46B *13/04*
U.S. Cl. 15—21 C **11 Claims**



1. A golf club grip cleaner comprising:

(a) a cleaning housing provided with a rotatably mounted cleaning tubular means sealed at its bottom end, said tubular means provided with a plurality of cleaning brushes mounted on the inside surface thereof;

(b) a power transducer housing provided with a water inlet means and a water outlet means and a waterwheel mounted on a shaft, said waterwheel activated by the flow of water introduced at said water inlet means;

(c) a support means for supporting said cleaning housing above said power transducer housing; and

(d) coupling means for connecting said waterwheel to said cleaning tubular means to rotate said cleaning tubular means.

4,897,893

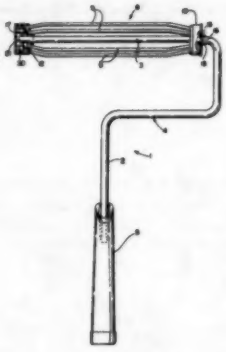
PAINT ROLLER FRAME INCLUDING SNAP-ON COVER FOR OUTBOARD END CAP

Richard L. Barker, Apple Creek, Ohio, assignor to The Wooster Brush Company, Wooster, Ohio

Filed Apr. 19, 1989, Ser. No. 340,432
Int. Cl.[4] B05C *17/02*, *1/08*
U.S. Cl. 15—230.11 **23 Claims**

1. A paint roller frame comprising a handle portion, a shaft portion extending generally at a right angle to said handle portion, and a roller cage assembly rotatably mounted on said shaft portion for supporting a roller cover thereon, said roller cage assembly including an outboard end cap having a radial outer wall portion, an axial outer end wall, and an axially outwardly opening cavity, said cavity receiving a free end of said shaft portion, and fastening means in said cavity for preventing removal of said outboard end cap from said shaft portion, and a cover inserted over said outboard end cap, said cover having an end wall extending the full radial extent of said axial outer end wall of said outboard end cap, and an axial

skirt portion extending the full axial extent of said radial outer wall portion, and cooperating surface means on said radial



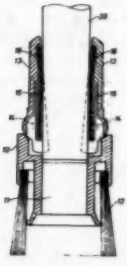
outer wall portion and skirt portion for retaining said cover on said outboard end cap.

4,897,894

VACUUM CLEANER NOZZLE

Stefan M. Fahlén, Bromma, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Sep. 17, 1987, Ser. No. 97,670
Claims priority, application Sweden, Oct. 3, 1986, 8604218
Int. Cl.[4] A47L 9/02
U.S. Cl. 15—365 **3 Claims**



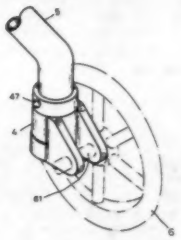
1. A nozzle for a vacuum cleaner being adapted to receive a suction conduit comprising a nozzle body provided with a suction passageway extending therethrough, both ends of said passageway being capable of alternately having attached thereto said suction conduit, a dust brush secured to and surrounding one end of said passageway, a pair of wing members each having outer and inner ends and being pivotally mounted at its inner end on the opposite end of said passageway and rotatable in opposite directions, each of said wing members having a resilient element mounted medially on the respective wing member and extending toward the inner end thereof, said resilient element having secured thereto a plush fiber picking material for cleaning textile materials said resilient element permitting the insertion of the suction conduit in said passageway to prevent damage to the plush picking material.

4,897,895

FRONT CASTER DEVICE FOR INFANT STROLLER

Kai-San Wang, Tainan Hsien, Taiwan, assignor to Sunshon Molding Co., Ltd., Tainan Hsien, Taiwan

Filed May 25, 1989, Ser. No. 356,553
Int. Cl.[4] B60B 33/00
U.S. Cl. 16—20 **1 Claim**



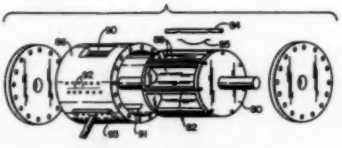
1. A front caster device for an infant stoller comprising:
a bracket for mounting an axle along an axis for rotatably mounting a ground supporting wheel thereto, having a tubular socket having an inner flange formed in an end away from an entrance of the socket on an inner periphery thereof said axle axis being transverse to a longitudinal axis of said tubular socket;
a bushing adapted to be rotatably fitted in said socket through the entrance thereof, having a flange provided with a pair of opposed holes adapted to correspond with a pair of opposed holes in a distal end of a front leg of an infant stroller and at least a flexible detent extending upwardly and outwardly from an outer periphery thereof, axially spaced from the flange and adapted to be engaged with the inner flange of the socket; and
a rivet for attaching the bushing to the distal end of the leg by insertion through said holes.

4,897,896

HARVESTING, SHUCKING AND EVISCERATING CLAMS AT SEA

William E. Gallant, Scarborough, Me., assignor to Borden, Inc., Columbus, Ohio

Division of Ser. No. 267,367, Nov. 4, 1988, which is a division of Ser. No. 122,014, Nov. 17, 1987. This application Jul. 12, 1989, Ser. No. 379,379
Int. Cl.[4] A22C 29/04
U.S. Cl. 17—74 **4 Claims**



1. A steamer comprising an inlet valve, a cylindrical body configured to receive high pressure steam and an outlet valve,
said inlet valve including a first cylindrical casing, a core coaxially mounted to rotate within said casing, said casing being sealed about said core at each end to prevent fluid leakage,
said casing including inlet and outlet openings, said outlet opening being connected in fluid communication with an inlet aperture into the cylindrical body,
said core including a plurality of radially extending vanes, each vane engaging the interior surface of said cylindrical casing to form a plurality of pockets, said pockets being

substantially sealed against any substantial fluid flow from one pocket to the other,

means for cooling the contents of each pocket as said core rotates said each pocket from fluid communication with the outlet opening to fluid communication with said inlet opening,

means for moving materials received through said inlet aperture along said cylindrical body to an outlet aperture,

said outlet aperture being in fluid communication with an inlet opening through a second cylindrical casing which comprises said outlet valve,

a second rotable core with radially extending vanes mounted coaxially with said second cylindrical casing to form pockets in said outlet valve,

means for cooling the contents of said pockets as said pockets rotate from fluid communication with the inlet opening of said outlet valve to an outlet opening through the second cylindrical casing.

4,897,897

CLOTHING FOR A CLEANING OR OPENING ROLLER

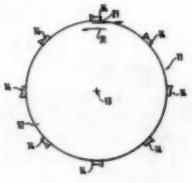
Paul Staheli, Wilen B. Wil, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Mar. 20, 1989, Ser. No. 325,655

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1988, 3811682

Int. Cl.[4] D01G *15/84*

U.S. Cl. 19—114 **20 Claims**



1. A toothed strip for forming a clothing on a roller, said strip including

a plurality of teeth disposed along a front face of the strip in alternating relation with a plurality of troughs, each said tooth having an equilateral triangular shaped front face and an equilateral triangular shaped back, each said back having an apex at said front face of the strip; and

each said trough being inclined upwardly from said front face of the strip towards a rear thereof.

4,897,898

ADJUSTABLE TAPE MEASURE CLIP

David S. Chapin, Raleigh, N.C., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Aug. 24, 1988, Ser. No. 235,665

Int. Cl.[4] A45F *5/02*

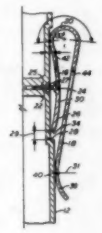
U.S. Cl. 24—3 J **6 Claims**

1. A clip for mounting a tool onto the user's apparel, comprising:

a spring of a continuous length of metal including a first length for mounting said spring to the tool, a third length for gripping the user's apparel, and a second length between said first and third lengths for elastically attaching said first length to said third length; connecting said first and third lengths;

said first length being disposed opposite said third length by said second length;

said third length in contact with said first length and pressing upon said first length with a contact pressure; and



said first length further having an excitation means for applying a force to said second length to adjust said contact pressure.

4,897,899

CABLE TIE

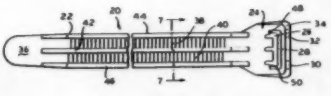
William W. Shely, St. Charles, and Peter M. Wells, Elgin, both of Ill., assignors to All States Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 107,295, Oct. 9, 1987, Pat. No. 4,788,751. This application Jul. 26, 1988, Ser. No. 224,584

The portion of the term of this patent subsequent to Dec. 6, 2005, has been disclaimed.

Int. Cl.[4] B65D *63/00*

U.S. Cl. 24—16 PB **8 Claims**



1. A cable tie comprising a unitary strap and head, said strap having a spaced parallel pair of racks of teeth extending along the length thereof, each of said teeth having a root and a crest with the crest of one tooth integrally joining the root of the next tooth with no break between them,

said teeth in one of said racks being juxtaposed in an aligned relationship with the teeth in the other of said racks whereby crests of said teeth in each of said racks are in contiguous alignment,

a pair of cantilevered positioned side-by-side with in said head to confront, to pivot, and to prop at a free end against individually associated ones of said racks of teeth,

said racks being separated by a medium strip having a substantially full strap thickness which at least equals the thickness of the strap at the crests of the teeth for adding plastic to said strap in the area where said free end of said cantilevered pawls prop against said teeth in said strap,

said pawls being separated from each other by a distance approximately equal to the width of said median strip so that each pawl is guided and directed by said median strap as it ratchets over its individually associated one of said rack of teeth to come to rest in a propping position against confronting teeth on said strap.

4,897,900

HOLDER FOR POCKET SQUARE

Rex A. Baggett, 3924 E. Yucca St., Phoenix, Ariz. 85028

Filed May 8, 1989, Ser. No. 348,875

Int. Cl.[4] A44B *21/00*

U.S. Cl. 24—543 **20 Claims**

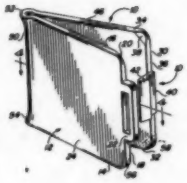
1. Pocket square holder apparatus for holding a pocket square, comprising, in combination:

panel means for holding a pocket square, including

first panel means, including a first panel having a first side, a second side, a top edge and a bottom edge, for holding a pocket square,

second panel means, including a second panel having a first side, a second side, a top edge, and a bottom edge, for cooperating with the first panel of the first panel means for holding a pocket square between them,

hinge means for securing the first and second panels together, including a hinge secured to the first sides of the first and second panels,



relieved portions at the junctures of the top edges and the second sides of the first and second panels for spreading the pocket square, and

means for locking the first and second panels together at their second sides;

a stop opening between the top edges of the first and second panels through which a first portion of the pocket square extends; and

a bottom opening between the bottom edges of the first and second panels through which a second portion of the pocket square extends.

4,897,901

MACHINE FOR BRUSHING FABRICS, EQUIPPED WITH COUNTER-PILE WORKERS AND WITH TEAZLES

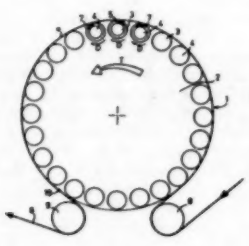
Michel Scholaert, Rue Verte, Allée Marie Antoinette No. 6, 59420 Mouvaux, France

Filed Dec. 12, 1988, Ser. No. 283,183

Claims priority, application France, Dec. 21, 1987, 87 18242; Dec. 21, 1987, 87 18241

Int. Cl.[4] D06C *11/00*

U.S. Cl. 26—33 **17 Claims**



1. A machine for brushing fabrics, of the type comprising in particular brushing rollers of the counter-pile type,

wherein it further comprises rollers of the teazle type, of small dimensions with respect to the width of the fabric, mounted to rotate freely, covered with a card clothing of which the teeth are directed parallel to their axis of rotation.

4,897,902

FABRICS AND TWISTED YARNS FORMED FROM ULTRAHIGH TENACITY AND MODULUS FIBERS, AND METHODS OF HEAT-SETTING

Sheldon Kavesh; Dusan C. Prevorsek, and Gary A. Harpell, all of Morris County, N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Division of Ser. No. 527,701, Sep. 1, 1983, Continuation-in-part of Ser. No. 429,942, Sep. 30, 1982, Pat. No. 4,819,458. This application Nov. 4, 1988, Ser. No. 267,423

Int. Cl.[4] D06C *7/00*; D03D *15/00*

U.S. Cl. 28—166 **11 Claims**

1. A method for preparing fabrics which comprises the steps:

(a) forming a fabric from stretched fibers of tenacity at least about 20 g/denier and tensile modulus at least about 600 g/denier containing polyethylene of weight average molecular weight at least about 500,000, and

(b) heating the fabric at a temperature between about 120° C. and about 155° C. sufficient and for a time sufficient for the fibers to shrink between about 1% and about 10% of their length in the fabric formed in step a.

4,897,903

METHOD OF PROVIDING AN INK JET PRINTING HEAD WITH PIEZO-CRYSTALS

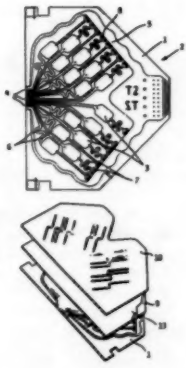
Fred Johannsen, Varel, Fed. Rep. of Germany, assignor to Olympia Aktiengesellschaft, Wilhelmshaven, Fed. Rep. of Germany

Filed Feb. 10, 1989, Ser. No. 309,082

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1988, 3804165

Int. Cl.[4] B41J *3/04*; G01D *15/18*

U.S. Cl. 29—25.35 **7 Claims**



1. A method of providing an ink jet printing head with piezo-crystals comprising the steps of:

(a) providing a plate-shaped basic printing head body including an ink supply reservoir, ink pressure chambers, ink exit openings, ink outlet channels which connect said pressure chambers with said ink exit openings, and ink inlet channels for connecting said pressure chambers with said ink supply chamber,

(b) providing a membrane plate,

(c) providing a piezo-ceramic plate,

(d) attaching said piezo-ceramic plate face-to face to said membrane place,

(e) attaching said membrane plate face-to-face to said basic body, and

(f) subsequent to step (d), entirely separating piezo-crystals from said piezo-ceramic plate by providing closed-course cuts through said piezo-ceramic plate such that a separate

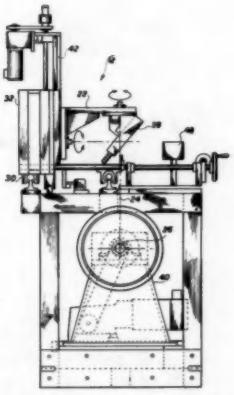
piezo-crystal is obtained in alignment with each said pressure chamber.

4,897,904

APPARATUS WHICH PROVIDES FOR THE PLACEMENT OF A BIT POINT OF A BIT AT A PREDETERMINED POSITION

Dennis Cowles, Broadview Heights, Ohio, assignor to Joy Technologies, Inc., Pittsburgh, Pa.

Filed Mar. 29, 1988, Ser. No. 174,599
Int. Cl.[4] B21D *39/03*
U.S. Cl. 29—33 K **31 Claims**



1. An apparatus which provides for the placement of a bit point of a bit at a predetermined position with respect to a rotatable member comprising:

a holder for holding a bit;

means for burning into the holder a surface which corresponds to a portion of the surface of the member; and

means for aligning the holder on the member such that the surface burned into the holder is adjacent the portion of the surface of the member, and the bit point of the bit is capable of being held by the holder at the predetermined position.

4,897,905

CONTROLLED DEFLECTION ROLL USING INERT GASSES AND INDEPENDENT LUBRICATION SYSTEM

Charles C. Moschel, Roscoe, Ill., assignor to Beloit Corporation, Beloit, Wis.

Filed Feb. 13, 1989, Ser. No. 308,921
Int. Cl.[4] B21B *27/06*
U.S. Cl. 29—116.2 **2 Claims**

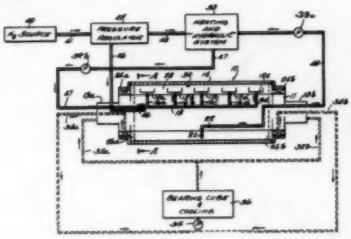
1. In a controlled deflection roll having a support shaft, a roll shell, bearings disposed about each end of the support shaft about which the roll shell is rotatably mounted, support element means mounted on the support shaft in a space between the support shaft and the inner surface of the roll shell in controlled supporting engagement therewith, the combination comprising:

seal means interposed between the bearings and the roll shell at each end of the support shaft to establish a fluid impermeable barrier between the interior space of the roll and the bearings;

bearing lubrication means in fluid communication with the bearings, said bearing lubrication means including a closed fluid loop and bearing pump means for conducting lubricant into and out of the bearings;

support element hydraulic means in fluid communication with the support element means, said support element hydraulic means including hydraulic pump means and a closed fluid loop for conducting hydraulic oil from outside the roll to the support element means and for conveying the hydraulic oil out of the interior of the roll;

heating means for heating the hydraulic oil in the closed fluid loop;



inert gas support means in fluid communication with (1) the interior space of the roll for supplying an inert gas to the interior of the roll between the seal means to establish and maintain an inert atmosphere within the roll, and (2) the means for heating the hydraulic oil;

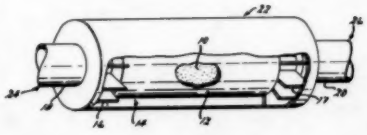
the closed fluid loop of the bearing lubrication means and closed fluid loop of the support element hydraulic means are independent and separate from each other.

4,897,906

METHOD OF MAKING A FLUID PRESSURE SURGE DAMPER FOR A FLUID SYSTEM

Donald D. Bartholomew, Marine City, Mich., assignor to Proprietary Technology, Inc., Mt. Clemens, Mich.

Division of Ser. No. 115,338, Nov. 2, 1987, Pat. No. 4,823,844.
This application Apr. 24, 1989, Ser. No. 341,908
Int. Cl.[4] B21K *21/00*; B21D *53/00*
U.S. Cl. 29—890.9 **3 Claims**



1. A method for forming a dampener comprising the steps of;

(1) inserting an elastomeric element within an unsealed flexible membrane means,

(2) compressing said elastomeric element and said unsealed flexible membrane,

(3) sealing said unsealed flexible membrane means, and

(4) releasing said compressed elastomeric element thereby producing a subatmospheric condition within said flexible membrane means.

4,897,907

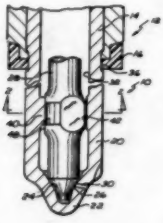
PROCESS FOR MANUFACTURING NOZZLE TIP

Lawrence J. Kopiec, Unionville, and Franklin S. Smith, Newington, both of Conn., assignors to Stanadyne Automotive Corp., Windsor, Conn.

Filed Mar. 31, 1989, Ser. No. 331,437
Int. Cl.[4] B21D *53/06*
U.S. Cl. 29—888.4 **10 Claims**

1. A process for manufacturing a nozzle tip from a tubular workpiece defining an axial bore and having a distal end and an open proximal end and an exterior surface comprising:

(a) exteriorly forming a circumferentially extending indentation in said workpiece between said distal end and said proximal end to form a corresponding indented wall of substantially uniform thickness defining an interior surface having a reduced inside diameter; and



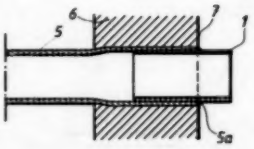
(b) removing material from said indented wall to form an integral collar defining a generally cylindrical guide surface having a substantially uniform diameter which is less than the diameter of non-indented portions of the axial bore.

4,897,908

METHOD OF ATTACHING TUBES IN A TUBE PLATE IN A HEAT EXCHANGER

Ragnar Henriksson, Linköping, Sweden, assignor to Asea Stal AB, Sweden

Filed Mar. 19, 1985, Ser. No. 713,704
Claims priority, application Sweden, Mar. 20, 1984, 8401533
Int. Cl.[4] B23P *15/26*
U.S. Cl. 29—890.44 **11 Claims**



1. A method of attaching an end of a tube of a first material of high chemical corrosion resistance to a tube plate of a second material of lower chemical corrosion resistance, said second material being at best substantially not weldable to said first material, the tube plate having an inner surface, an outer surface and a hole therethrough and the end of said tube extending through the hole in said tube plate so as to extend from the inner surface thereof to the outer surface thereof, said method including the steps of

attaching a sleeve of at least substantially the same material as said first material to said end of the tube so that said sleeve extends away from the outer surface of said tube plate, said sleeve having a bore therethrough in fluid communication with the interior of said tube,

placing a cover plate of at least substantially the same material as said first material a distance away from the outer surface of said tube plate so as to leave a space between said cover plate and said tube plate, said cover plate having a hole therein which is aligned with the bore in said sleeve, and

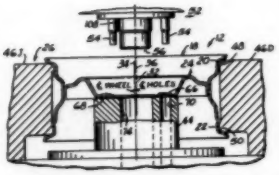
welding said sleeve to the cover plate to provide a fluid-tight joint therebetween.

4,897,909

METHOD FOR WHEEL MANUFACTURE BY PUNCH FORMING

Warren J. LaVoy, Morepeth, Canada, assignor to Motor Wheel Corporation, Lansing, Mich.

Filed Dec. 29, 1988, Ser. No. 291,551
Int. Cl.[4] B21H *1/02*
U.S. Cl. 29—894.325 **15 Claims**



1. A method of punch forming a through-opening in a pierceable metal blank having a stock thickness MT measured axially of said opening in a margin material which surrounds said opening after the same has been formed, said blank having first and second opposite faces and said opening extending therebetween, said opening having a predetermined finished inner peripheral dimension DS defined by inner peripheral wall surface means in said margin material extending circumferentially of said opening between said first and second blank faces, said method comprising the steps of:

(1) providing pierce punch means having a working end face transverse to the axis of said pierce punch means and shank surface means intersecting said pierce end face having an outer peripheral dimension DP smaller by a predetermined amount than DS,

(2) providing shave punch means having a working end face transverse to the axis of said shave punch means and shank surface means intersecting said shave end face and having an outer peripheral dimension DS and an inner peripheral dimension DP,

(3) operating said pierce punch means in a working stroke with its axis aligned coaxially with said opening axis to cause said pierce working end face to strike said first blank face and then move through said blank material past said second blank face,

(4) operating said shave punch means in a working stroke with its axis aligned coaxially with said opening axis to cause said shave working end face to strike said first blank face after said pierce end face has has traveled a predetermined distance SB from said first face toward said second face and to then move through said blank material past said second blank face in trailing relation to said pierce end face, and

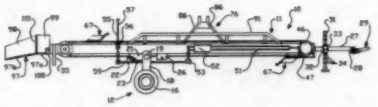
(5) correlating the dimension DS, DP and SB with one another relative to dimension MT to cause said pierce and shave punch means to cojointly punch out a one-piece scrap slug to thereby form said opening with an inner peripheral wall surface having a generally smooth and generally cylindrical contour at said DS dimension.

4,897,910

METHOD FOR REMOVING SPRINKLER PIPE FROM A FIELD

William D. Miller; Omar L. Stiff, both of Brawley, and Benardo Mercurio, El Centro, all of Calif., assignors to William D. Miller, Inc., Brawley, Calif.

Continuation of Ser. No. 761,958, Sep. 6, 1985, abandoned, which is a division of Ser. No. 484,844, Apr. 14, 1983, Pat. No. 4,553,900. This application Apr. 27, 1987, Ser. No. 48,464
The portion of the term of this patent subsequent to Nov. 19, 2002, has been disclaimed.
Int. Cl.[4] B23P *19/00*
U.S. Cl. 29—426.3 2 Claims



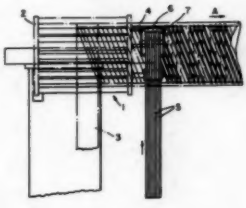
1. A method for removing sprinkler pipe from a field in which the sprinkler pipe is disposed in rows in the field with the sprinkle pipe in each row being formed of serially connected lengths of sprinkler pipe, comprising: engaging an attachment carried by a pulling means to a leading end of the sprinkler pipe, the attachment adapted to engage said leading end, and said pulling means with the attachment located on an elongate framework having ground engaging means; advancing the pulling means by use of a motive means that may be connected to and disconnected from the pulling means to withdraw at least one length of the serially connected lengths of pipe from the field without the elongate framework entering therein; carrying along the advancing pipe longitudinally of and onto the elongate framework, and centering the pipe on the framework; disconnecting a length of sprinkler pipe from the serially connected lengths of pipe; engaging said attachment to the leading end of the remaining serially connected lengths of pipe; and again advancing the pulling means to withdraw at least one additional length of the serially connected lengths of pipe from the field longitudinally of and onto the elongate framework without the elongate framework entering therein.

4,897,911

METHOD OF PLACING PLASTIC TUBES INTO EXISTING OPENINGS

Rachid Keldany, IM Aeglisten 3, CH-8124 Maur, and Keith J. Shaw, Rainstrasse 50, CH-8804 Pfäffikon, both of Switzerland

Filed Apr. 28, 1988, Ser. No. 187,266
Claims priority, application Switzerland, Apr. 28, 1987, 1605/87
Int. Cl.[4] B21D *39/03;* B23P *11/00*
U.S. Cl. 29—429 10 Claims



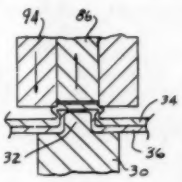
1. A method for increasing the stiffness of flexible plastic tubes after they are inserted into existing through-passages or into existing pipe lines, comprising the following steps: at an entrance to a through-passage, continuously forming a spirally wound tube from a band of plastic material with side edges of the band in abutting relationship, the wound tube being flexible and having an initial stiffness; simultaneously pushing the wound tube into the through-passage as it is being formed; applying a hardenable stiffening material onto the outer wall surface of the wound tube as it is being formed and thereafter, but before the setting of the stiffening material, positioning the wound tube with applied stiffening material at a desired position within said through-passage; and permitting the stiffening material to set to thereby impart to said wound tube after it is in its desired position in the through-passage a stiffness increase by the setting of the stiffening material when compared with its initial stiffness.

4,897,912

METHOD AND APPARATUS FOR FORMING JOINTS

Arthur L. Slasinski, Harper Woods, Mich., assignor to Weldex, Inc., Warren, Mich.

Division of Ser. No. 71,451, Jul. 8, 1987, Pat. No. 4,856,316. This application Mar. 20, 1989, Ser. No. 326,160
Int. Cl.[4] B23P *11/00*
U.S. Cl. 29—432.2 4 Claims



1. A method of forming a clinch joint between two sheets of material, comprising the steps of:

(A) relatively displacing a die and a punch during a first portion of a workstroke to form a cup in a section of said sheets;

(B) relatively displacing the die and an anvil during a second portion of a workstroke to laterally deform peripheral portions of the sheet section defining said cup, the relative displacement of the die and anvil being sufficient to allow said peripheral portions to be displaced laterally beyond said anvil so that part of said laterally deformed portions overlap said die; and

(C) relatively displacing the die and the anvil during a third portion of a workstroke to further deform said peripheral portions in the direction of displacement of said die.

4,897,913

METHOD OF USING A ROBOT FOR INSTALLING WEATHER STRIPPING IN A DOOR OR LIKE OPENING

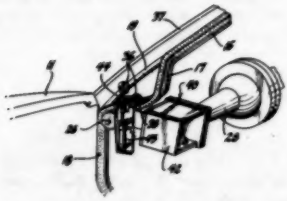
Stephen St. Angelo, Jr., Rochester Hills, Mich.; George C. Carver, Albany; David W. Patterson, Duluth, both of Ga., and Owen K. Fremont, Rochester, Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 161,500, Feb. 29, 1988, Pat. No. 4,839,958, which is a continuation-in-part of Ser. No. 888,238, Jul. 18, 1986. This application Apr. 17, 1989, Ser. No. 339,269
The portion of the term of this patent subsequent to Jun. 20, 2006, has been disclaimed.
Int. Cl.[4] B23P *11/02*
U.S. Cl. 29—450 1 Claim

1. A method of utilizing a robot having an arm and a pressure roller having a variable rotational velocity to install fixed lengths of weather stripping into a body opening including generally straight sections and corner sections, said method in combination comprising:

interacting and tracing said pressure roller along a straight

section of the opening at a first linear speed and at a first rotational speed and interacting and tracing said pressure roller along a corner section at a second linear speed differing from said first linear speed and at a second rotational speed differing from said first rotational speed, whereby said fixed length is guided and affixed with the



said sections as said fixed length is installed into said body opening and the relative velocity of a point on the periphery of said pressure roller relative to a point in said door opening in said corner section is such that said weather stripping is longitudinally compressed in said corner section.

4,897,914

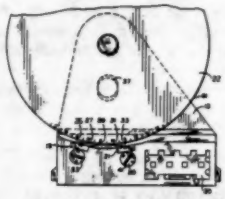
METHOD OF MAKING A MAGNETIC-ENCODING DEVICE HAVING HALL EFFECT DEVICES

Robert J. Loubier, 5122 Chippewa Ct., Fort Wayne, Ind. 46804

Division of Ser. No. 652,867, Sep. 20, 1984, Pat. No. 4,829,248. This application Dec. 16, 1988, Ser. No. 285,499

Int. Cl.[4] H01F *7/06*

U.S. Cl. 29—602.1 **3 Claims**



1. The method of fabricating a magnetic-encoding device having a Hall effect switch and a rotatable disc-shaped actuating magnet comprising the steps of forming an integral frame with at least two component-locating positions, one of said component-locating positions being sized to receive snugly a Hall effect switch, fitting such a switch onto said one position thereby locating said switch-relative to the second of said two positions, forming a disc-shaped permanent magnet with circumferentially alternating poles on its periphery and a predetermined outer diameter, mounting said magnet for rotation about its axis to said second position with its periphery adjacent to said Hall effect switch, said second portion serving to locate said magnet relative to said switch whereby said frame and said two component-locating positions serve to locate and position said switch and magnet relative to each other with a minimum of dimensional tolerance therebetween.

4,897,915

PROCESS FOR PRODUCING MAGNETIC HEAD OF FLOATING TYPE

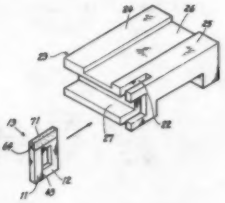
Kiyotaka Ito, Daito, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Jan. 6, 1989, Ser. No. 294,012

Claims priority, application Japan, Jan. 7, 1988, 63-1765; Oct. 6, 1988, 63-252385

Int. Cl.[4] G11B *5/42*

U.S. Cl. 29—603 **4 Claims**



1. A process for producing a magnetic core of the floating type by fitting a head core with a magnetic gap portion into a core accommodating groove in a slider having a face to be opposed to a magnetic recording medium, and securing the head core to the slider by a glass filled portion formed in a clearance within the groove around the head core, the process comprising the steps of:

(a) preparing a core chip comprising a pair of core segments butting on each other with a gap spacer formed therebetween to provide a magnetic gap portion, the core chip having a medium opposed portion of a small width extending over the pair of core segments, this step including forming a glass layer on the core chip covering the medium opposed portion,

(b) fitting the core chip prepared by the first step into a core accommodating groove formed in a slider chip,

(c) bonding the core chip to the slider chip by melting the glass layer formed on the core chip to fill the molten glass into a clearance within the core accommodating groove around the core chip, and

(d) machining the resulting assembly of slider chip and core chip to form the face to be opposed to the magnetic recording medium.

4,897,916

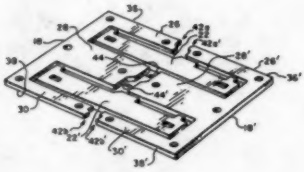
METHOD FOR MAKING A TRANFORMER CORE ASSEMBLY

Raymond L. Blackburn, Crystal Lake, Ill., assignor to Coils, Inc., Huntley, Ill.

Division of Ser. No. 237,056, Aug. 29, 1988, Pat. No. 4,827,237. This application Jan. 17, 1989, Ser. No. 300,410

Int. Cl.[4] H01F *41/02*

U.S. Cl. 29—609 **7 Claims**



1. A method for forming a transformer core assembly with a mechanical interference fit between first and second lamination stacks forming the transformer core assembly, said method comprising the steps of:

providing two stacks of laminations;

providing identical coupling formations at two spaced apart locations on one side of one stack of laminations;

providing offset side surfaces connected by an inclined surface intermediate the two coupling formations;

providing one side of the other stack of laminations with a mating configuration;

providing a dimension, D, for each stack between a side edge of the stack and the inclined surface with the dimension D_2 of the second stack being greater than the dimension D_1 of the first stack; and

positioning the inclined surface on the mating configuration on the other stack at a location transversely offset from the location of the inclined surface on one side of the first stack so that when the two stacks are forced together an interference fit between the inclined surfaces will force the mating coupling formations to tightly engage each other and so forcing the mating coupling formations of the stacks together.

4,897,917

METHOD OF ASSEMBLING COMPONENTS OF AN ELECTROCHEMICAL GENERATOR USING THIN FILMS OF LITHIUM

Michel Gauthier, La Prairie-Quebec, and Andre Belanger, Sainte Julie, both of Canada, assignors to Societe Nationale Elf Aquitaine, Courbevoie, France and Hydro-Quebec, Quebec, Canada

Filed Jul. 13, 1988, Ser. No. 218,243
Int. Cl.[4] H01M *6/18*
U.S. Cl. 29—623.3 **11 Claims**

1. A method for assembling the components of an electrochemical generator, wherein said components are in the form of thin films and comprise, as a first component, a lithium- or lithium alloy-based negative electrode and, as a second component, at least one thin film of a solid polymer electrolyte capable of conducting lithium ions, said method comprising:

(i) using a negative electrode precursor which consists of an intermediate assembly formed from a thin film of lithium or lithium alloy supported by an inert plastic film having controlled adhesion to the lithium such that the bond of the lithium-based film to said inert plastic film is sufficient to permit the handling of said intermediate assembly but is less than the bond of the lithium film to the solid polymer electrolyte of the component containing said electrolyte; and

(ii) applying the free metal surface of said intermediate assembly against said solid polymer electrolyte of the component containing said electrolyte by working these at a temperature and under a pressure sufficient to cause the lithium of said intermediate assembly to adhere to said solid polymer electrolyte.

4,897,918

METHOD OF MANUFACTURING AN INTERBOARD CONNECTION TERMINAL

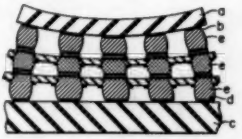
Takaaki Osaka; Norio Matsui, both of Tokyo; Shinichi Susaki, Iruma, and Yutaka Egawa, Tokyo, all of Japan, assignors to Nippon Telegraph and Telephone, Tokyo, Japan

Division of Ser. No. 23,552, Feb. 19, 1987, Pat. No. 4,783,722.
This application Mar. 25, 1988, Ser. No. 173,745
Claims priority, application Japan, Jul. 16, 1985, 60-156621; Jun. 13, 1986, 61-137961
Int. Cl.[4] H05K *1/11*
U.S. Cl. 29—830 **7 Claims**

1. A method of manufacturing an interboard connection terminal, comprising the steps of:

forming a metal interlayer of a three-layer structure by forming a through-hole in an unsolderable and insulating support board, forming a first metal layer by charging a solderable metal located into part of the through-hole, forming a second metal layer, stacked on the first metal layer, the second metal layer being a layer of unsolderable metal and serving to prevent diffusion of solder therethrough, and forming a third metal layer, stacked on the second metal layer, by charging a solderable metal into part of the through-hole, the third metal layer together with the first and second metal layers forming said three-layer structure; and

arranging on the support board a mask having a through-hole corresponding to and immediately above the through-hole of the support board, placing a first solder ball in the through-hole of the mask, and thermally fusing and thereafter cooling the first solder ball, thereby fixing



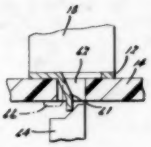
the first solder ball on the third metal layer, and arranging under the support board a mask having a through-hole corresponding to and immediately under the through-hole of the support board, placing a second solder ball in the through-hole of the mask, and thermally fusing and thereafter cooling the second solder ball, thereby fixing the second solder ball on the first metal layer, the step of forming a metal interlayer of the three-layer structure being also performed with the step of forming a unit basic structure.

4,897,919

METHOD FOR PRODUCING A STAMPED SUBSTRATE

Dale K. Wheeler, Fallston, Md., assignor to Black & Decker Inc., Newark, Del.

Continuation of Ser. No. 923,807, Oct. 27, 1986, abandoned.
This application Nov. 23, 1988, Ser. No. 277,471
Int. Cl.[4] H01R *9/14*
U.S. Cl. 89—845 **21 Claims**



1. A method for attaching a select portion of a planar member to a substrate, said planar member having first and second surfaces, said first surface comprising a plurality of lances projecting below said planar member substantially normal thereto, said selected portion having a first interengaging member comprising at least one of said lances, said substrate having a second interengaging member comprising an aperture, said method comprising the steps of:

locating said planar member proximate to said substrate such that said one lance is substantially perpendicular to said substrate and at a position above said aperture;

disposing a die between said first surface of said planar member and said substrate;

disposing a punch proximate to said second surface of said planar member; and

displacing said punch in a downward direction to separate said selected portion from said planar member, said step of displacing said punch in a downward direction operable to secure said selected portion to said substrate by inserting said lance into said aperture thereby causing mechani-

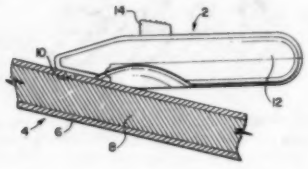
cal interference between said lance and said aperture, said step of displacing said punch in a downward direction operable to form said selected portion and secure said selected portion to said substrate in a single downward stroke of said punch.

4,897,920

SHEATH CUTTING TOOL

Donald W. Dunbar, 2945 Thomas St., Nanaimo, B.C., Canada V9T 2Y5

Filed Jun. 7, 1988, Ser. No. 204,159
Claims priority, application Canada, Jun. 19, 1987, 540152
Int. Cl.[4] B26B *27/00*
U.S. Cl. 30—90.4 **12 Claims**



1. A cutting tool useful for cutting sheathing on a cable comprising:

(a) hand-grip holder having a general tapered shape for holding therein a cutting blade in a position retracted in the holder or in a position extending from the holder;

(b) a cutting blade having on one side an effective cutting surface along its exposed length when the cutting blade is in an extended position, the cutting surface of the cutting blade being angled in the direction of cut when in an extended position;

(c) blade moving means located on the exterior or the holder for enabling the cutting blade to be moved from a retracted position to an extended position from the narrow end of the holder and alternatively from an extended position to a retracted position;

(d) compression spring means located within the holder for urging the cutting blade into a retracted position when the cutting blade is in an extended position; and

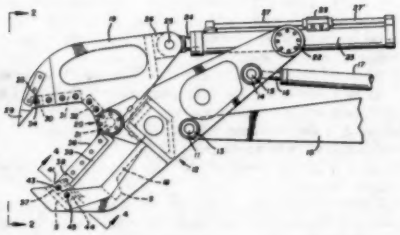
(e) stop means located in the end of the holder for controlling the distance that the cutting blade extends from the holder when in an extended position.

4,897,921

METAL CUTTING SHEAR WITH CHANGEABLE MULTIPLE CUTTING EDGE PORTIONS

John R. Ramun, Youngstown, Ohio, assignor to Allied Gator Inc., Youngstown, Ohio

Filed Aug. 4, 1988, Ser. No. 228,104
Int. Cl.[4] B23P *19/00*
U.S. Cl. 30—134 **10 Claims**



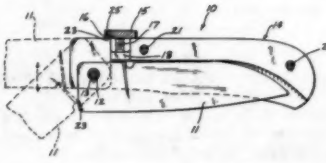
1. An improvement in a shear for a backhoe having a boom with a controlled piston and cylinder assembly connected thereto, said shear having an elongated fixed cutting blade having a raised cutting edge portions and means for attaching said fixed cutting blade to said boom, said fixed cutting blade having horizontally spaced vertically positioned parallel beam portions and horizontal sections therebetween, a movable cutting blade having a plurality of cutting edge portions, means inwardly of a first end of said fixed cutting blade pivotally mounting said movable cutting blade therebetween in pivotal relation to said fixed cutting blade from an open position to a closed work piece shearing position and means for keeping the plurality of cutting edge portions of said movable cutting blade in shearing relation to said raised cutting edge portion of said fixed cutting blade through the entire extent of the shearing movement of the blades with respect to each other, said means for keeping the cutting edge portions of said movable cutting blade in shearing relation to said raised cutting edge portion of said fixed cutting blade comprising a slot in one of said horizontal sections of said fixed cutting blade and inwardly of said first end thereof and defining an elongated guide path, said slot being positioned and sized to receive and maintain said movable cutting blade and said plurality of cutting edge portions thereon in shearing relation to a work piece disposed between said blades; the improvement comprising said plurality of cutting edge portions of said movable cutting blade being positioned to form a continuous cutting edge and being removably affixed to said movable cutting blade, at least one of said plurality of cutting edge portions including a plurality of sides and at least two sharp cutting edges on at least two of its sides and being mounted on said movable cutting blade to be changeably positioned on said movable cutting blade to be moved from a position having a sharp cutting edge of one side aligned with the sharp cutting edges of the remainder of the cutting edge portions to another position having a sharp cutting edge of another side in alignment with those cutting edges of the remainder of said plurality of cutting edge portions and wherein one of said cutting edge portions is directly adjacent said means pivotally mounting said movable blade.

4,897,922

FOLDING KNIFE

Dennis B. Brooker, Derby, Iowa, assignor to Ventura Forge, Inc., Ventura, Calif.

Filed Jul. 17, 1989, Ser. No. 381,751
Int. Cl.[4] B26B *3/06*
U.S. Cl. 30—166 **9 Claims**



1. A folding knife apparatus comprising:

an elongated handle having a slot formed therein; opposite to said working edge, said opposite edge having an abutment portion on one end thereof, said blade having a storage position wherein said working edge is disposed in said slot and a working position thereof approximately 180 degrees from said storage position thereof wherein said working edge extends out of said slot;

means for pivotally attaching one end of said knife blade to said handle along a first axis for permitting movement of said blade between the storage and working positions thereof;

a lock member, said lock member having a locked position and a unlocked position;

means for rotatably attaching said lock member to said handle along a second axis between said locked and unlocked positions thereof;

said lock member being in engagement with said abutment portion of said opposite edge of the blade when said blade is in said working position and said lock member is in the locked position thereof; and said lock member being spaced from said blade abutment portion when the lock member is in the unlocked position thereof.

4,897,923

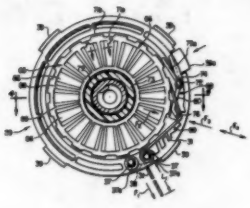
AUTOMATIC LINE FEED HEAD APPARATUS FOR A FLEXIBLE LINE TRIMMER OR THE LIKE

Imack L. Collins, Shreveport, La., assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 908,214, Sep. 17, 1986, Pat. No. 4,835,867, which is a continuation-in-part of Ser. No. 631,000, Jul. 16, 1984, which is a continuation of Ser. No. 245,459, Mar. 19, 1981, abandoned, which is a continuation of Ser. No. 891,666, Mar. 30, 1978, abandoned. This application Dec. 20, 1988, Ser. No. 287,388

Int. Cl.[4] B26B *7/00*

U.S. Cl. 30—276 **19 Claims**



11. A method of rotationally supporting in a bearing pocket structure an essentially straight central portion of a member having outwardly bent first and second opposite end portions, said method comprising the steps of:

providing a tubular coil spring member;

installing said coil spring member on said central portion by sequentially sliding said spring member onto said first end portion, bending said spring member around the juncture between said first end portion and said central portion, and pushing said spring member onto said central portion to position the opposite ends of said spring member between said outwardly bent first and second end portions; and

press-fitting the installed spring member into said bearing pocket structure.

4,897,924

HAND MEASUREMENT APPARATUS

George T. Tepley, Chattanooga, Tenn., assignor to TGC Corporation, Chattanooga, Tenn.

Filed Aug. 19, 1988, Ser. No. 233,951

Int. Cl.[4] A41H *1/02*

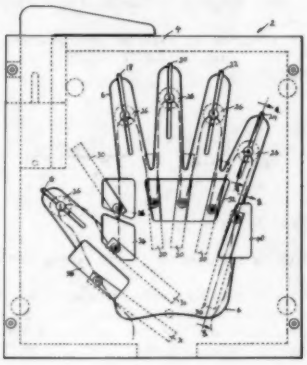
U.S. Cl. 33—2 R **19 Claims**

1. Apparatus for measuring dimensions of a human hand having a back portion, a palm portion, fingers and a thumb, said apparatus comprising:

plate means for supporting an outstretched hand,

a plurality of movable locator means for measuring finger length, extending through the plate means,

a plurality of movable locator means for measuring the width of the base of at least one finger, extending through the plate means, and



means on the locator means for recording the positions of said locator means on the surface of a sheet.

4,897,925

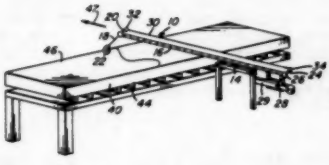
APPARATUS FOR DETERMINING SURFACE PROFILES OF METALLIC WORKPIECES

Robert H. Johns, Natrona Heights, Pa., assignor to Allegheny Ludlum Corporation, Pittsburgh, Pa.

Filed Dec. 15, 1987, Ser. No. 132,294

Int. Cl.[4] G01B *5/28*

U.S. Cl. 33—22 **10 Claims**



1. Apparatus for determining a surface profile of a metallic workpiece, said apparatus including:

a measuring arm means for engaging with a surface of the workpiece during translation across the width of the workpiece;

translating means including a support frame and a rail beam slidably positioned on the support frame, said rail beam having a pivotal connection at a first end portion thereof for pivotally connecting said measuring arm means to the rail beam, said translating means serving to translate the measuring arm means in a widthwise direction across the workpiece; and

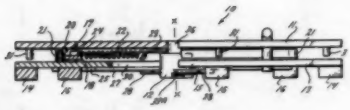
recording means interconnected with the measuring arm means such that pivotal movement of the measuring arm means during translation across the width of the workpiece causes corresponding movement of the recording means to thereby record the surface profile of the metallic workpiece, said recording means including a recording arm pivotally connected to a second end portion of the rail beam, a tie rod for interconnecting the measuring arm and the recording arm such that deflection of the measuring arm during translation across the width of the workpiece causes deflection of the recording arm, an ink dispenser positioned at one end of the recording arm, and a paper tape positioned proximate to the ink dispenser for recording the deflection of the recording arm.

4,897,926

VEHICLE WHEEL TURNING ANGLE GAUGE

Paul J. Altnether, and Timothy A. Strege, both of St. Louis County, Mo., assignors to Hunter Engineering Company, Bridgeton, Mo.

Filed Sep. 14, 1988, Ser. No. 244,040
Int. Cl.[4] G01B 11/275
U.S. Cl. 33—203.14 2 Claims



1. In a vehicle wheel turning angle gauge, the combination comprising:

(a) a stationary base plate and a superimposed vehicle wheel contact plate maintained in spaced relation by a bearing assembly permitting the contact plate to move in linear and angular directions relative to said stationary base plate;

(b) a tracking assembly movably positioned on said base plate, said base plate having a window opening to permit a view of the underside of said contact plate;

(c) an optical shaft encoder device operably movable with said wheel contact plate within said base plate window, a rotational responsive connection with said contact plate to follow the angular turning response imparted to said contact plate by a vehicle wheel in contact with said contact plate, said encoding device developing a signal output for determining the magnitude and the direction of rotation of said contact plate relative to said base plate;

(d) protective enclosure is mounted at the underside of said contact plate and is formed with an open bottom to receive said optical shaft encoder device; and a body of pliable material is applied to said protective enclosure for encapsulating and retaining said encoder device against rotation relative to said protective enclosure; and

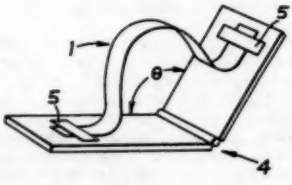
(e) signal processing means connected to said encoder device for displaying said magnitude and direction of rotation of said wheel contact plate.

4,897,927

ELECTRICAL ANGULAR DISPLACEMENT SENSOR

Alexander C. Nicol, Glasgow, Scotland, assignor to University of Strathclyde, Glasgow, Scotland

PCT No. PCT/GB85/00387, § 371 Date Dec. 1, 1986, § 102(e) Date Dec. 1, 1986, PCT Pub. No. WO86/01588, PCT Pub. Date Mar. 13, 1986
PCT Filed Aug. 30, 1985, Ser. No. 948,347
Claims priority, application United Kingdom, Sep. 1, 1984, 8422136
Int. Cl.[4] A61B 5/10
U.S. Cl. 33—534 9 Claims



1. An electrical sensor for use in providing a signal indicative of angular displacement between two spaced locations, comprising a generally planar flexible carrier of material capable of flexing when its ends are fixed to said locations and said locations undergo relative rotary movement within a predetermined angular range; and at least one electrically conductive element having a resistance which is a function of strain affixed to the carrier and extending therealong substantially the whole distance between said locations; wherein said electrically conductive element comprises a wire resistance strain gauge and the thickness of said carrier is selected such that the strain at the surface thereof does not exceed a predetermined limit when the carrier is flexed by relative rotary movement of said locations within said predetermined angular range, said limit being selected such that there is no permanent plastic deformation of the carrier or the strain gauge when the relative movement of said locations within said predetermined angular range causes maximum flexure of the carrier; and wherein the thickness of the carrier is determined according to the equation:

$$Y=\epsilon R;$$

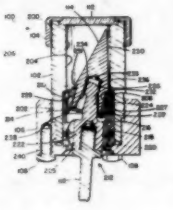
where Y is half the thickness of the carrier, ϵ is the maximum permissible strain at the surface thereof, and R is the minimum required radius of curvature of the carrier.

4,897,928

HOLE ANGULARITY GAUGE

David C. Maxville, Seattle; Kenneth R. Meade, Sr., Bothell, and David G. Beal, Kent, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jun. 29, 1988, Ser. No. 212,914
Int. Cl.[4] G01B 5/24
U.S. Cl. 33—534 15 Claims



1. Apparatus for measuring the perpendicularity of a bore, comprising:

a hollow body having an inside wall, said body including a base receiving portion and an upper portion opposite said base receiving portion;

a base mountable to said base receiving portion of said body;

a clear scale window having a plurality of concentric circles printed thereon, each circle for indicating the angular offset of the bore centerline from an ideal centerline which is perpendicular to the plane of the surface of the bore;

a scale retaining cap mountable to said upper portion of said body to mount said scale window to said body;

first and second radial bearing assemblies each including a hollow bearing press fit into a bearing guide, said first radial bearing assembly being fixedly mounted within said body and said second radial bearing assembly being slidably mountable within said body and secured within said body by said base;

a cone-shaped pointer having a conical portion, a bearing engaging portion, an abutting edge intermediate said bearing engaging portion and said conical portion and an interior channel extending inward from said bearing engaging portion, said bearing engaging portion being fixed to said first radial bearing assembly such that said abutting edge engages said hollow bearing of said first radial bearing assembly to position said pointer therein whereby said pointer may undergo unrestricted radial movement within a predetermined range; and

a lever having a bearing engaging base portion slidably mountable to said second radial bearing assembly, a retaining lip fixed to said bearing engaging base portion and engagable intermediate said base and said hollow bearing of said second radial bearing assembly to position said lever within said second radial bearing assembly, a shaft extending outward from said bearing engaging base portion and a tooling ball attached to said shaft, said second radial bearing assembly being slidable within said body such that said tooling ball extends inward of said interior channel of said pointer whereby said tooling ball contacts the walls of said interior channel, said lever also including a probe portion extending outward from said base portion in a direction opposite that of said shaft to engage the bore being measured.

4,897,929

MULTI-COORDINATE PROBE

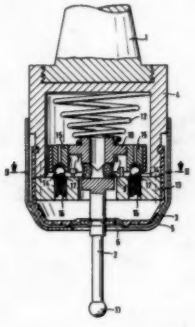
Alfons Ernst, and Dieter Spark, both of Traunreut, Fed. Rep. of Germany, assignors to Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Dec. 9, 1986, Ser. No. 939,899

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1986, 3640160

Int. Cl.[4] G01B *7/28, 11/24*

U.S. Cl. 33—559 **5 Claims**



1. Multi-coordinate probe with at least one stylus having a longitudinal axis and being deflectable into several coordinate directions which is biased by a restoring force into a bearing arrangement determining its zero position, which bearing arrangement is constituted by the cooperation of surface regions of several bearing members with surface regions of a corresponding quantity of counterbearing support members, wherein the bearing members and the counterbearing support members assigned to them are arranged concentrically around the stylus axis, characterized in that the surface regions of the bearing members and of the counterbearing support members are circular, the probe includes mounting means for adjustably carrying the bearing members and the counterbearing support members so that the bearing members and the counterbearing support members are adjustable radially and axially with respect to each other in such a way that in the zero position of the stylus the contact regions of the respective surface regions of the bearing members and the surface regions of the associated counterbearing support members form respectively a circuit line, and that the entirety of the circular line thus generated lies in a plane perpendicular to the stylus axis, the counterbearing support members respectively having one conical bore at their front faces facing the bearing members, whose axis extends respectively parallel to the longitudinal axes of the counterbearing support members, and the counterbearing support members being seated eccentrically in rotatable receiving cylinders.

4,897,930

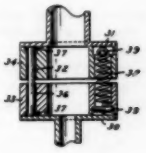
PRECISION PARALLEL MECHANICAL FLOAT

Robert F. Cusack, Grosse Pointe Park, Mich., assignor to GTE Valenite Corporation, Troy, Mich.

Continuation of Ser. No. 941,679, Dec. 15, 1986, Pat. No.

Int. Cl.[4] G01B *5/25*

U.S. Cl. 33—644 **1 Claim**



1. Precision parallel float mechanism comprising a base including three substantially equally spaced first registration surfaces in a fixed plane of reference, a relatively displaceable member having three directly opposed corresponding second registration surfaces, said directly opposed corresponding second registration surfaces being positioned in another plane of reference parallel to said fixed plane of reference whereby a pair of opposed registration surfaces are formed with each first registration surface and a respective directly opposed corresponding registration surface, three rigid columns each rigid column having a pair of peripheral contact surfaces engaging respectively a pair of said opposed registration surfaces, yieldable preloaded resilient means establishing normal compressive peripheral contact engagement with said first and second registration surfaces subject to each column tilting to opposite peripheral side edge contact with respective registration surfaces in response to a predetermined force couple imposed on the parallel planes of reference of said base and displaceable member, said mechanism including means for confining said peripheral contact surfaces against lateral displacement relative to said registration surfaces.

4,897,931

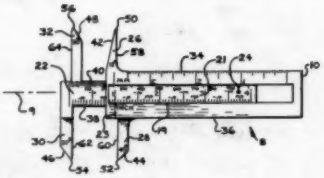
ANGLE INDICATING CALIPER

Stephen D. Goulette, Rives Junction, Mich., assignor to Aeroquip Corporation, Jackson, Mich.

Filed Sep. 23, 1988, Ser. No. 248,141

Int. Cl.[4] G01B *5/14*

U.S. Cl. 33—810 **3 Claims**



1. A slide caliper for measuring the characteristics of a hose fitting wherein the hose fitting includes a conical sealing surface having an angle of convergence and the caliper includes a body having a longitudinal axis, a slide mounted on the body for movement relative to the body in the direction of the axis, first and second measurement extensions mounted on the body and slide, respectively, extending in a transverse direction to the body axis for engaging the fitting to be measured and indicia defined on the body and slide to indicate the relative movement therebetween, each extension including a first edge perpendicular to the body axis and a second edge, the improvement comprising an angular surface defined on the second edge of each of the extensions having a predetermined angular

orientation to the body axis, the angular orientation of said angular surfaces being different and of an angle corresponding to a standard sealing surface angle whereby placing an angular surface against a fitting sealing surface permits the angle of the fitting surface to be determined.

4,897,932

MASTER OPTICAL DISK HEAT-DRYING APPARATUS

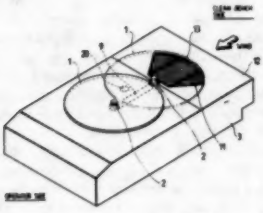
Kazumi Kuriyama, Yamanashi, Japan, assignor to Pioneer Electronic Corporation, Tokyo and Pioneer Video Corporation, Yamanashi, both of, Japan

Filed Mar. 14, 1989, Ser. No. 322,941

Claims priority, application Japan, Sep. 2, 1988, 63-219979; Sep. 2, 1988, 63-219980; Sep. 2, 1988, 63-219981; Sep. 2, 1988, 63-219982

Int. Cl.[4] F26B *19/00*

U.S. Cl. 34—52 **13 Claims**



2. An apparatus for heat-drying a master optical disk, said apparatus comprising:

heating means for radiation-heating said master optical disk;

carrying means for carrying said master optical disk above said heating means so as to be parallel with and opposite to said heating means; and

air blowing means for sending clean air at least between said heating means and said master optical disk.

4,897,933

TABLEWARE DRYING MACHINE

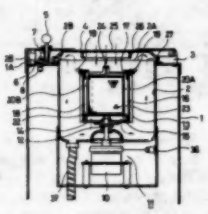
Junya Ito; Akihiko Chiba; Masuo Oku, all of Gunma, and Hitoshi Komada, Saitama, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Sep. 9, 1988, Ser. No. 243,069

Claims priority, application Japan, Sep. 17, 1987, 62-232918; May 19, 1988, 62-122344

Int. Cl.[4] F26B *17/30*

U.S. Cl. 34—58 **9 Claims**



1. A tableware drying machine, comprising:

a drying tank the top of which is open to the air,

a drying machine housing for accommodating the drying tank,

a tableware container, the surrounding walls of which have a plurality of holes therethrough for drying, said container being adapted for receiving tableware such as a spoon which has been washed,

a container receiving frame for receiving the tableware container, said receiving frame being mounted for rotation about an axis at high speed in the drying tank, said container rotating with said receiving frame when said container is received therein, at least a portion of the surfaces of said frame and container being oriented relative to said rotational axis to induce a flow of air when rotating,

motor means for rotating the container receiving frame and said container at said high speed,

a lid for opening and closing the drying tank top, air intake openings being provided in the lid for taking air into the drying tank when the lid is closed, said air intake being induced by means of said high speed rotation of the container receiving frame with the container therein, and

an outlet opening for discharging said air from said drying machine.

4,897,934

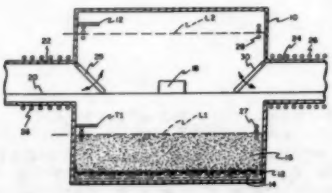
VAPOR PHASE PROCESSING SYSTEM

Douglas J. Peck, North Andover, Mass., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Aug. 13, 1987, Ser. No. 84,963

Int. Cl.[4] F26B *19/00*

U.S. Cl. 34—78 **3 Claims**



1. A vapor processing system comprising:

a vessel for containing a processing vapor,

means for heating an electronic liquid contained within said vessel to generate saturated vapor;

means for conveying work product through said vessel along a substantially horizontal path,

first condensing means for defining a lower level first defining means of said saturated vapor at a selected or adjustable level below said path,

second means for defining an upper level second defining means of said saturated vapor at a selected or adjustable level above said path; and

means for operating said second defining means for at least a portion of the time the work product is located within said vessel whereby the saturated vapor will envelop and process the work product; and

means for operating said first defining means for the remaining portion of the time whereby the saturated vapor will be maintained below the path thereby minimizing vapor loss along the path out of the vessel.

4,897,935

NON-SLIP MEANS AND THEIR USES ON SHOE SOLES

Jean-Louis Fel, 26 rue de Combat - Belbex, 15000 Aurillac, France

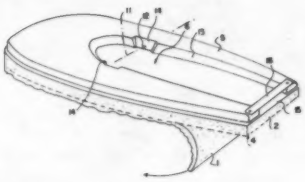
PCT No. PCT/FR87/00077, § 371 Date Jan. 4, 1988, § 102(e) Date Jan. 4, 1988, PCT Pub. No. WO87/05475, PCT Pub. Date Sep. 24, 1987

PCT Filed Mar. 18, 1987, Ser. No. 133,047

Claims priority, application France, Aug. 19, 1986, 86 04306; Sep. 18, 1986, 86 13302

Int. Cl.[4] A43B 3/18

U.S. Cl. 36—7.7 9 Claims



2. A non-slip device fastenable to a shoe by means of a strap, the said device comprising a pad, wherein the pad has a rigid shell shape and defines a recess in the form of the imprint of a shoe, a non-slip surface carried by the pad, wherein the non-slip surface is composed of at least one layer of elastic cellular material with open cells and of low density, and a second layer of cellular material of high density located between the pad and the open-cell layer.

4,897,936

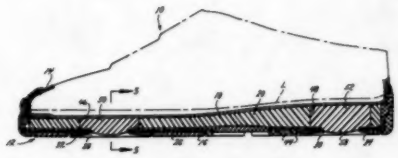
SHOE SOLE CONSTRUCTION

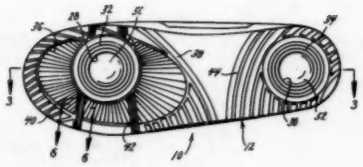
Rory W. Fuerst, Menlo Park, Calif., assignor to Kaepa, Inc., San Antonio, Tex.

Filed Feb. 16, 1988, Ser. No. 156,176

Int. Cl.[4] A43B 13/12, 13/04, 13/18, 5/00

U.S. Cl. 36—30 A 14 Claims





1. A shoe sole comprising:

(a) an insole,

(b) an outsole including a portion located at the ball of the foot and a portion located at the heel of the foot including an opening in at least one of said portions, said outsole having a ground-engaging surface,

(c) a midsole cushioning portion sandwiched between said insole and said outsole and including at least one cavity opening of a size greater than the outsole opening and being generally concentric with said outsole opening, and

(d) an insert is disposed within the cavity opening of the midsole portion, said insert having an outer portion of a size substantially the same as the size of the midsole cavity opening, said insert having an inner central portion substantially the same size as, and generally concentric with said outsole portion opening and projecting into said opening but not beyond the outsole ground-engaging surface and having an annular portion overlapping said outsole opening operatively bearing on the outsole.

4,897,937

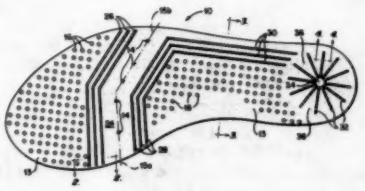
NON-SLIP INSOLE BASE

Kenneth W. Misevich, Piscataway, and Thomas E. Mintel, Somerset, both of N.J., assignors to Colgate-Palmolive Company, Piscataway, N.J.

Filed Sep. 23, 1987, Ser. No. 100,062

Int. Cl.[4] A43B 13/38

U.S. Cl. 36—43 5 Claims



1. An insole base to be positioned below a shoe insole to provide a non-slip surface for receiving said shoe insole in a shoe construction, comprising:

a show sole member having an upper surface in the shape of the bottom of a foot with a medial side and a lateral side, said upper surface having a smooth surface portion in the region proximate and adjacent to the location of the metatarsal heads of said foot, at least one raised ridge positioned in the upper surface of said sole member anterior to said smooth surface portion and at least one raised ridge positioned in the upper surface of said sole member posterior to said smooth surface portion, each raised ridge extending from the medial side of the sole member in a direction generally parallel to the transverse metatarsal axis which passes through the first and second metatarsal heads of the foot and with each said raised ridge then being angled so as to extend toward the lateral side of the sole member in a direction generally parallel to the oblique metatarsal axis which passes through the third, fourth and fifth metatarsal heads.

4,897,938

SHOE FREELY FITTING TO A FOOT AND A FOOT BED

Akira Otsuka, 13, Nanpeidai-Cho, Tokyo, Japan

PCT No. PCT/JP87/00287, § 371 Date Jan. 7, 1988, § 102(e) Date Jan. 7, 1988, PCT Pub. No. WO87/06804, PCT Pub. Date Nov. 19, 1987

PCT Filed May 9, 1987, Ser. No. 150,646

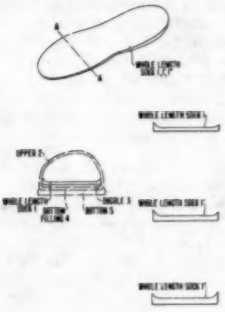
Claims priority, application Japan, May 9, 1986, 61-104858; Nov. 5, 1986, 61-261944

Int. Cl.[4] A43B 7/14, 3/26, 13/38

U.S. Cl. 36—88 6 Claims

1. A combination of a shoe comprising a main body having a longitudinal length corresponding to one of several standardized lengths and an inner circumference which is larger than inner circumferences corresponding to said standardized length, and a plurality of foot supporting inserts detachably insertable within said shoe main body to complete said shoe, said inserts each having a shoe engaging surface and a foot engaging surface, said shoe engaging surface of each said insert

being nestable within and substantially identical in contour to a corresponding inner portion of said shoe, said foot engaging surface being prefabricated and preshaped and varying from



insert to insert so as to fit foot bottoms different in width and to conform generally to different contours of feet such that said shoe main body is fittable to different feet according to selection of one of said inserts.

4,897,939

FOOTWEAR REINFORCEMENT

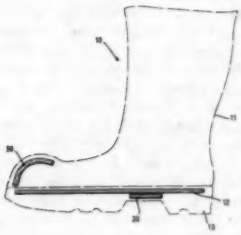
Robert Harrington, Bootle, England, assignor to Dunlop Limited a British Company, United Kingdom

Filed Oct. 6, 1988, Ser. No. 254,243

Claims priority, application United Kingdom, Oct. 13, 1987, 8723962

Int. Cl.[4] A43B *23/00*

U.S. Cl. 36—108 **7 Claims**



1. In a footwear article suitable for heavy duty outdoor use consisting of an upper attached to an outsole member and a flexible metal midsole member secured between said upper and said outsole member, the improvement which comprises securing an additional arch-reinforcement member within the sole between said flexible metal midsole member and said outsole member so as to strengthen the sole in the area contacted by a shovel when the wearer is using a shovel for digging.

4,897,940

SKI BOOT WITH HEEL SECURING DEVICE

Mariano Sartor, Montebelluna, Italy, assignor to Nordica S.p.A., Montebelluna, Italy

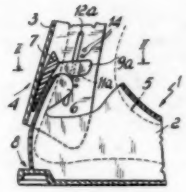
Filed Sep. 7, 1988, Ser. No. 240,909

Claims priority, application Italy, Sep. 15, 1987, 82586 A/87

Int. Cl.[4] A43B *5/04*

U.S. Cl. 36—119 **18 Claims**

1. Rear-entry ski boot with heel securing device, comprising a shell with which there is articulated at least one rear quarter, comprising at least one wedge-like element interposed, at the skier's heel region, between the rear inner surface of said rear quarter and the skier's foot, with said wedge-like element there being associated means, actuatable by the skier, for its translatory motion, wherein said means for the translatory motion of



said wedge-like element are constituted by a pair of elastically deformable wings, protruding laterally from said wedge-like element, said wings affecting the inner lateral surfaces of said rear quarter.

4,897,941

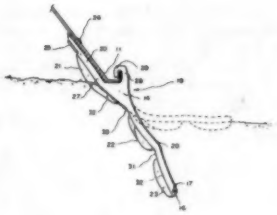
SNOW GROOMING COMB

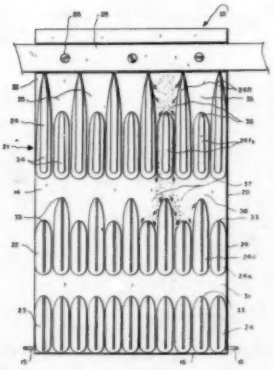
William B. Sinykin, Logan, Utah, assignor to Logan Manufacturing Company, Logan, Utah

Filed Aug. 21, 1988, Ser. No. 396,925

Int. Cl.[4] E01H *4/00*

U.S. Cl. 37—222 **5 Claims**





1. A snow combing device adapted to be secured to the trailing edge of the skirt of a snow tilling device, said snow combing device comprising:

an elongate backing plate of resilient elastic material having provisions for securement to the trailing edge;

a laterally directed foremost row of alternately longer and shorter elongate combing teeth downstanding from the backing plate in the vicinity of said trailing edge, the shorter teeth being positioned between rearward portions of the longer teeth, each of the teeth having a rearmost elongate portion of generally triangular cross section and a foremost portion joining the rearmost portion and tapering therefrom laterally and upwardly to a point on the under surface of the backing plate; and

at least one additional laterally directed row of alternately shorter and longer combing teeth downstanding from the backing plate rearwardly of the foremost row, each longer and shorter tooth of each additional row being aligned respectively with a shorter and a longer tooth of the row immediately forward thereof, the shorter teeth of each additional row being positioned between rearward portions of the longer teeth of the row, and each additional tooth in each additional row having a rearmost elongate portion of generally triangular cross section and a foremost portion joining the rearmost portion and tapering therefrom laterally and upwardly to a point on the under surface of the backing plate.

4,897,942

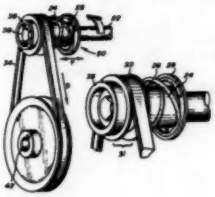
HIGH EFFICIENCY SNOWTHROWER

Kenneth H. Klas, Port Washington, and Richard R. Brown, Fredonia, both of Wis., assignors to Simplicity Manufacturing, Inc., Port Washington, Wis.

Filed Oct. 14, 1988, Ser. No. 257,798

Int. Cl.[4] E01H *5/09*

U.S. Cl. 37—244 **2 Claims**



1. A snow removal apparatus, comprising:

an engine;

means for engaging and displacing accumulated snow; and

means for coupling said engine to said engaging and displacing means so as to maintain a substantially constant load on said engine and while said engine operates at said constant load said coupling means transmits the power from said engine to said displacement means to achieve maximum snowthrowing distance for the engaged snow depending on the weight and depth of the accumulated snow encountered by said engaging and displacing means.

4,897,943

PHOTOGRAPHIC DISPLAY AND APPARATUS FOR MAKING ELEMENTAL PRINTS OF THE SAME

Katsumi Otake, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 18, 1988, Ser. No. 169,790

Claims priority, application Japan, Mar. 18, 1987, 62-39569[U]; Mar. 18, 1987, 62-63184; Apr. 6, 1987, 62-84275

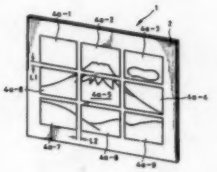
Int. Cl.[4] A47G *1/06*

U.S. Cl. 40—158.1 **18 Claims**

1. A picture display for displaying a large photographic picture, said large photographic picture representing an enlargement of an image recorded on an image frame of a film original, said display comprising:

a display panel; and

a roll of photographic paper containing a plurality of print portions which comprise enlarged images of a plurality of divisions into which said image frame is nominally divided, said print portions being formed consecutively on



said roll of said photographic paper, said roll of photographic paper being cut into said print portions after processing;

wherein said plurality of print portions are arranged in a predetermined fashion on said display panel so as to present substantially the same photographic picture as said large photographic picture.

4,897,944

PHOTOGRAPHIC PICTURE DISPLAY, APPARATUS AND METHOD OF MAKING ELEMENTAL PRINTS THEREOF

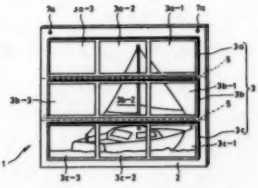
Katsumi Otake, Tokyo; Kiichiro Sakamoto, Kanagawa, and Mikio Kogane, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 20, 1988, Ser. No. 196,524

Claims priority, application Japan, May 20, 1987, 62-123053; Jun. 12, 1987, 62-146654; Jun. 17, 1987, 62-150810

Int. Cl.[4] A47G *1/06*

U.S. Cl. 40—159 **25 Claims**



2. A photographic picture display for displaying a large photographic picture corresponding to a smaller image frame, said display comprising:

a display panel;

a plurality of picture strips attached to said display panel to form a single picture;

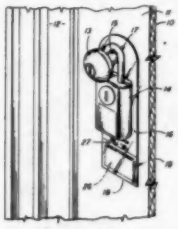
each said picture strip comprising consecutively positioned enlarged divisional images of corresponding adjacent divisions of said smaller image frame, said smaller image frame being notionally divided into a matrix of divisions, wherein said picture strip is formed with a row of enlarged divisional images with separation therebetween, corresponding to a row of divisions of said smaller image frame.

4,897,945

LOCK BOX DOOR PROTECTOR

Larry R. Webb, 2008 Stanley Rd., Cazenovia, N.Y. 13035

Filed Oct. 17, 1988, Ser. No. 258,660
Int. Cl.[4] G09F 3/00
U.S. Cl. 40—331 **6 Claims**



1. A lock box door protector for protecting the stile of a door from abrasion or damage when a realtor's key lock box is hung from a doorknob stem thereon, and which also proffers a supply of business cards, the door protector comprising an elongated strip of a resilient material having an upper end and a lower end, with an opening at said upper end to be placed over said doorknob and suspended from said stem, a pocket formed at the lower end of said strip to contain said supply of business cards, and said strip being of sufficient length so that said pocket is positioned below the base of a standard lock box suspended from the doorknob stem over said protector;

wherein said pocket includes means visibly displaying said cards while protecting them from the weather;

wherein the strip is of two layers at least at said lower end, with a clear plastic front layer and another layer behind to define said pocket; and

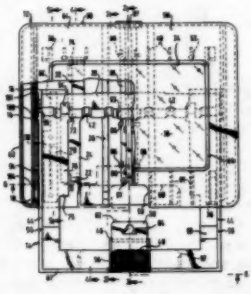
wherein said other layer has a slit therein for access to said business cards from behind the door protector.

4,897,946

DEVICE FOR THE CYCLIC REARRANGEMENT OF A PILE OF RECTANGULAR OR SQUARE SHEETS

Peter Ackeret, Kusnacht, Switzerland, assignor to Licinvest AG, Chur, Switzerland

Continuation of Ser. No. 888,332, Jul. 11, 1986, Pat. No. 4,777,748. This application Jul. 29, 1988, Ser. No. 226,068
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1984, 3441489
The portion of the term of this patent subsequent to Oct. 18, 2005, has been disclaimed.
Int. Cl.[4] G09F 11/30
U.S. Cl. 40—513 **43 Claims**



1. A device for cyclic rearrangement of a pile of substantially planar rectangular sheets, said pile having a principal plane parallel to the plane of said sheets, comprising first and second frame parts movable relative to each other in a predetermined direction parallel to said principal plane, and including means for removal of an individual sheet from one end of the pile leaving a remainder of said pile and for adding said individual sheet to the other end of the remainder of the pile upon reciprocal relative movement of the frame parts, said individual sheet having a first substantially planar face in contact with said remainder of said pile prior to removal, said means comprising:

separating means for separating said individual sheet from the pile,

means for feeding sheets to said separating means and for displacing said individual sheet relative to said remainder of said pile so as to expose said first planar face thereof,

first retaining means for holding said individual sheet in said first frame part and second retaining means for holding the remainder of the pile in said second frame part, and

means for guiding the individual sheet after separation for the purpose of returning it to the other end of the remainder of the pile, wherein said first retaining means comprises:

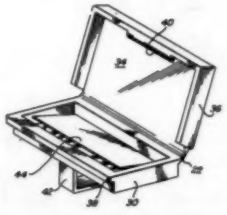
a roller element rotatably journalled to said second frame part and rolling on said first face of said individual sheet after separation, a counter element on one of said frame parts opposite to and cooperating with said roller element to clamp said individual sheet between said roller and counter elements so as to hold said individual sheet in said first frame part over a first predetermined portion of said relative movement of said frame parts, and means for urging said roller and counter elements toward one another.

4,897,947

IDENTIFICATION HOLDER FOR MOUNTING ON SHOES

Stephanie Kass-Pious, 157 Tremont St., Hartford, Conn. 06105

Filed Jan. 9, 1989, Ser. No. 294,217
Int. Cl.[4] A44C 3/00
U.S. Cl. 40—636 **9 Claims**



1. An identification member adapted to be secured to a shoe or the like having lacing or like elements extending transversely thereof, comprising:

(a) an integrally formed elongated carrier or synthetic resin having a base and cover hingedly connected along one side margin thereof, said base including a bottom wall and a sidewall extending about the periphery thereof to define an upwardly opening cavity, said sidewall of said base having outwardly extending flanges at its upper end along said one side margin and along the side margin opposite thereto, said base also having an elongated, generally U-shaped engagement loop depending from said bottom wall and providing a passage through which shoe laces or the like may be passed to secure the carrier to the top of the associated shoe, said engagement loop extending transversely of the elongated dimension, said cover having a top wall and a depending sidewall extending about the

major portion of its periphery, said sidewalls of said base and cover being dimensioned and configured to interfit with said base extending into said cover, said cover being releasably engaged with said base to close said cavity, said cover having an inwardly projecting boss on the lower end of its sidewall opposite said one side margin and said boss snap fitting under said flange on said base, said hinged connection being provided along the outer edge of said flange on said base, said sidewall on said cover extending along said margin opposite that providing the hinged connection and along the adjacent side margins to provide a generally U-shaped sidewall which receives the base therebetween;

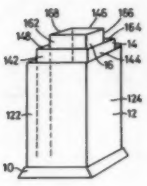
(b) an identification element removably seated within said carrier.

4,897,948

DISPLAY SYSTEMS

Gordon Owen, 48 Milton Dr., Ravenshead, Nottingham, England

Filed Sep. 18, 1987, Ser. No. 98,273
Int. Cl.[4] G09F *3/18*
U.S. Cl. 40—661 **15 Claims**



1. A display system for the display of information to a customer including a first hollow box section tube fixed to a base and including at least one further box section tube of smaller cross-section fitted within the first hollow box section tube to be readily removable therefrom and in which information relating to a customer's requirements is displayed on at least one face of each of the tubes, in which each tube is provided with means for retaining a card within the tube, in which the card is printed with information for the customer, each tube being transparent such that information on the card may be read through the tube, in which the card is replaceably retained within the tube and in which each tube is provided with means for retaining the card within close proximity to the inside surfaces of the tube.

4,897,949

FIREARMS

Roland G. Whiteing, 45 Duncan Road, Glenferness, Midrand, South Africa

PCT No. PCT/GB86/00788, § 371 Date Jun. 23, 1988, § 102(e) Date Jun. 23, 1988, PCT Pub. No. WO87/03952, PCT Pub. Date Jul. 2, 1987
PCT Filed Dec. 22, 1986, Ser. No. 216,718
Claims priority, application South Africa, Dec. 23, 1985, 85/9792
Int. Cl.[4] F41C *7/02;* F41D *5/02*
U.S. Cl. 42—10 **12 Claims**

1. A firearm comprising:

a. a main housing having

a.1 a main bore,

a.2 a loading passage through which a cartridge can be inserted into the main bore; and

a.3 an eject passage through which a cartridge case can be ejected from the main bore;

b. a breech at one end of the main bore;

c. a firing pin at the breech end of the main bore;

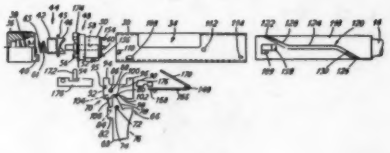
d. a sleeve rotatably fitting in the main bore and having

d.1 a port therein which corresponds in size and axial location to the loading passage;

e. a barrel having

e.1 a bore therethrogh which is shaped to inhibit the cartridge casing from passing along the barrel, and

e.2 a rear end that is telescopically received within the sleeve, the barrel being axially movable from a rear



position in which it engaged the breech to a forward position; and

f. engaging cam means and cam follower means formed on the barrel and sleeve to cause rotation of the sleeve on axial movement of the barrel;

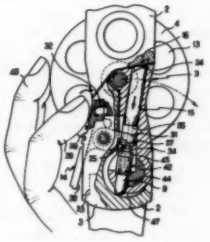
the arrangement being such that when the barrel is in the forward position, the port will be adjacent the loading passage; and when the barrel is intermediate the front and rear position the port will be adjacent the eject passage.

4,897,950

LOCKING DEVICE FOR THE CRANE OF A REVOLVER

Alain Lechelle, Mulhouse; Thierry Guidat, Brunstatt, and Serge Bruckert, Cernay, all of France, assignors to Matra Manurhin Defense, Velizy-Villacoublay, France

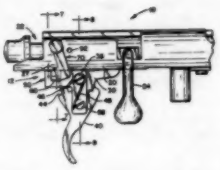
Filed Feb. 21, 1989, Ser. No. 313,380
Claims priority, application France, Feb. 26, 1988, 88 02399
Int. Cl.[4] F41C *1/02, 25/10*
U.S. Cl. 42—62 **10 Claims**



1. A revolver comprising: a locking device for locking a crane of a revolver, the crane supporting a cylinder and including a shaft pivotally mounted on a frame of the revolver for swinging parallel to the axis of a barrel of the revolver between a closed position in which the axis of the cylinder lies in the plane of symmetry of the revolver and an open position on one side of the revolver in which chambers of the cylinder are disengaged for loading or ejecting ammunition; the locking device being for holding the crane in position when the crane is in the closed position and further comprising a pushbutton and a sliding latch both mounted on the crane, the sliding latch having a locking end that is normally received, when the crane is in its closed position, in an associated notch in the frame of the revolver, the pushbutton being laterally accessible from a side of the revolver opposite to the one side from which the cylinder is swung out and co-operating directly with the sliding latch for retracting the locking end thereof, whereby the disposition of the pushbutton makes it possible to unlock the

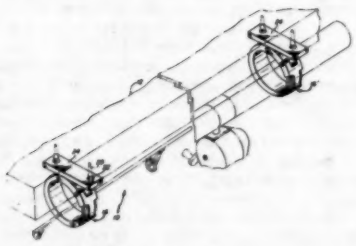
crane using the same hand as is used for pushing the cylinder into its swung-out position.

4,897,951
FIREARM SAFETY
William E. Osborne, Guilford, Conn., assignor to The Marlin Firearms Company, North Haven, Conn.
Filed Oct. 24, 1988, Ser. No. 261,621
Int. Cl.[4] F41C 17/02
U.S. Cl. 42—70.06 **20 Claims**



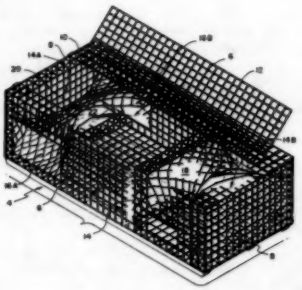
1. A safety for a firearm having a receiver and a trigger pivotally mounted at the underside of the receiver comprising:
bracket means pivotally mounted at the underside of the receiver for restricted pivotal movement, said bracket means defining first and second recesses;
biasing means for pivotally biasing said bracket means in a first pivotal direction;
operator arm means captured between said bracket means and receiver, said operator arm means having an engagement portion for pivotal engagement at the underside of said receiver and a generally opposing locking dog, said operator arm means comprising handle means for manually pivoting said operator arm means and detent means for pivotal engagement in said recesses; and
trigger catch means for engagement by said locking dog to prevent pivotal movement of the trigger;
so that when said operator arm means is in a safety pivotal position, the locking dog engages the trigger catch means and the detent means is retainably engaged in said first recess and said operator arm means is pivotally moveable to a fire pivotal position wherein said bracket means pivots to permit said detent means to rock into engagement into said second recess whereby said locking dog disengages said trigger catch means.

4,897,952
FISHING ROD HANGER
Robert L. Hawie, Stratford, Conn., assignor to The Hawie Manufacturing Co., Bridgeport, Conn.
Filed Jan. 28, 1988, Ser. No. 149,554
Int. Cl.[4] A01K 97/10
U.S. Cl. 43—21.2 **15 Claims**



1. A fishing rod hanger comprising at least one cooperating bracket member adapted to support a fishing rod, said bracket member comprising:
a cylindrical channel surface adapted to receive a portion of the rod, said cylindrical channel surface being substantially circular in shape;
a channel passage formed in said channel surface comprising a section between the outer peripheral surface and the channel surface of said bracket member, said channel passage being defined by first and second transverse edges of said bracket member, each of said edges defining a portion of the bracket member extending from the outer peripheral surface to the cylindrical channel surface; and
latch means moveably connected to said bracket member for obstructing said channel passage whereby the portion of the rod received in the bracket member is confined within the channel surface; said latch means being pivotably hinged at one end to said first transverse edge, said latch means being selectively locked at a second end to said second transverse edge; and
said second transverse edge including an indentation extending from said outer peripheral surface, an inner peripheral surface of said indentation having a slot for receiving said second end of said latch means.

4,897,953
LOBSTER TRAP
Charles F. Bruce, R.F.D. 1, Box 1490, Rockland, Me. 04841
Filed Feb. 27, 1989, Ser. No. 316,236
Int. Cl.[4] A01K 71/00
U.S. Cl. 43—102 **5 Claims**



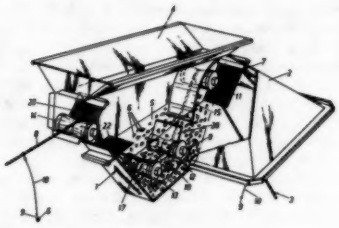
1. In a lobster trap comprising a lattice-work case an improved trap head comprising
means defining a pair of opposed openings in opposite sides of the case,
a funnel-like net within said case interconnecting said openings and providing a continuous lobster passage between said openings,
said net decreasing in diameter with distance from said openings and having its minimum diameter midway between said openings, and
means defining an opening from the minimum diameter portion of said net into the interior of said case.

4,897,954

APPARATUS FOR BAITING LONG LINES

Bert U. Gustavsson, Nävragöl, Sweden, assignor to Profish International AB, Solna, Sweden

PCT No. PCT/SE87/00137, § 371 Date Sep. 16, 1988, § 102(e) Date Sep. 16, 1988, PCT Pub. No. WO87/05465, PCT Pub. Date Sep. 24, 1987
PCT Filed Mar. 18, 1987, Ser. No. 124,098
Claims priority, application Sweden, Mar. 19, 1986, 8601268
Int. Cl.[4] A01K 79/00
U.S. Cl. 43—27.4 3 Claims



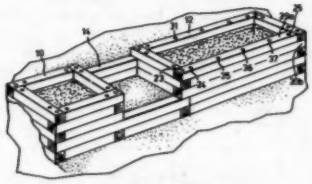
1. An apparatus for baiting long lines (3) comprising a reef line (8) and a number of hook leaders (10) depending therefrom at regular intervals, each supporting a hook (9) at its outer free end, said apparatus comprising a container (1) holding water (5) mixed with bait (6) and being equipped at its bottom with guide rollers (12, 13) serving to conduct a long line (3) introduced into the container (1) at the top thereof through said mixture of water (5) and bait (6), characterized therein that the container (1) is provided with a first baffle (17) which extends essentially in the direction of advancement of the reef line (8) and which is adjustable into various angular positions relative to the interior end wall (18) of the container so as to define together with said interior container wall a baiting zone (19) of varyable width through which the reef line (8) including its hook leaders (10) and hooks (9) are made to pass during the line advancement through the container (1).

4,897,955

WOODEN LANDSCAPING STRUCTURES

Gerald K. Winsor, 30 Cranberry Crescent, Kemptville, Ontario, Canada KOG 1J0

Continuation-in-part of Ser. No. 157,496, Feb. 12, 1988, abandoned. This application Dec. 19, 1988, Ser. No. 286,237
Claims priority, application Canada, Feb. 16, 1987, 529787
Int. Cl.[4] A01B 1/08; E04B 1/00
U.S. Cl. 47—33 10 Claims



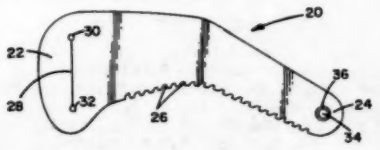
7. A kit for constructing landscaping structures comprising:
a plurality of top and bottom timbers, each bottom timber having two spaced parallel blind corner holes provided transversely near a first end and one blind corner hole parallel to the other two blind corner holes provided near a second end, each top timber having two spaced parallel corner holes provided transversely through the top timber near a first end and one corner hole parallel to the other two corner holes provided transversely through the top timber near a second end, the corner holes of the top timbers being spaced to align with blind corner holes of bottom timbers at overlapping corners when a plurality of the top timbers are arranged to overlay a geometrically-arranged layer of a plurality of the bottom timbers, each timber having at least one intermediate joiner hole provided parallel to said corner holes and blind corner holes spaced from the first and second ends of the timber for alignment with said at least one joiner hole of an overlying timber when a plurality of the bottom timbers are arranged to overlay, with overlapping corners, a geometrically-arranged layer of a plurality of the top timbers; and
a plurality of hardwood dowels adapted to be snugly fitted through the aligned corner and blind corner holes, and into intermediate joiner holes of overlying timbers.

4,897,956

TREE BRACING APPARATUS

Robert M. McGuire, Rte. 1, Box 123B, Stacy, Minn. 55079

Filed Oct. 1, 1987, Ser. No. 103,844
Int. Cl.[4] A01G 17/04
U.S. Cl. 47—43 8 Claims



1. A three point tree bracing collar for bracing a tree, said collar formed of substantially planar, elongate plastic material and having first and second ends with said second end including a slot through which said first end can be passed in order to wrap the collar around a tree trunk, said first end including means for attaching a first anchoring line thereto, said collar providing a surface against and around which one or more other anchoring lines may be fastened when the collar is wrapped around said trunk whereby said first and one or more other anchoring lines can be anchored to the ground to provide three point bracing, said collar curved relative to its longitudinal axis so that said first end extends downwardly when said collar is wrapped around said trunk, the length of said collar engaging the tree trunk when it is wrapped thereabout having a width and rigidity sufficient to disperse the bracing forces of the anchoring line attached to said first end and the one or more other lines wrapped over said collar over an area of the tree trunk sufficient to avoid sawing of the collar into the tree trunk and girdling of the tree trunk.

4,897,957

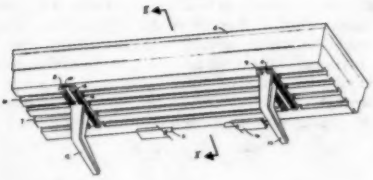
PRECISION FLOWERING OF REGAL PELARGONIUMS (*PELARGONIUM XDOMESTICUM*)

J. Robert Oglevee, and Richard Craig, both of Connellsville, Pa., assignors to Oglevee, Ltd. and Research Corporation Technologies, Inc., a part interest

Filed Apr. 12, 1988, Ser. No. 180,471
Int. Cl.[4] A01H 3/02
U.S. Cl. 47—58 13 Claims

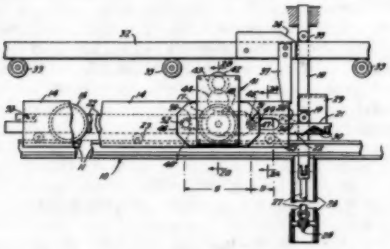
1. A method for the precisely timed production of a Regal Pelargonium plant in 13–16 weeks, comprising the steps of:
vegetative propagation;
floral initiation; and
finishing, wherein said floral initiation step further comprises controlling minimum total accumulated light exposure per plant to between 350 to 425 moles.

4,897,958
WINDOW-BOX AND SUPPORT
Ronald Brydges, 6 Faye Cresent, St. Catharines Ontario, Canada L2N 1N7
Filed Oct. 24, 1988, Ser. No. 261,722
Int. Cl.[4] A01G *9/02*
U.S. Cl. 47—68 9 Claims



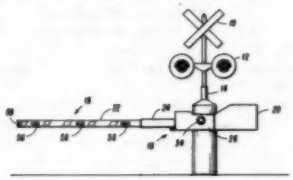
1. A window-box and mounting assembly for mounting on a window set in a wall comprising a rectangular plastic tray having an inner edge adjacent a window a lip formed on said inner edge to engaging a ridge on a ledge on a same side of the window as said tray and a pair of legs adjustably mounted on the bottom of said tray and engaging a wall below a ledge.

4,897,959
JAIL CELL LOCK MECHANISM
Donald A. Worden, Pompton Plains, N.J., assignor to Marotta Scientific Controls, Inc., Montville, N.J.
Filed Mar. 15, 1989, Ser. No. 324,408
Int. Cl.[4] E05B *47/06;* E05F *15/00*
U.S. Cl. 49—18 8 Claims



1. In a system for operating from a remote-control station one or more of a plurality of cell doors arranged substantially in horizontal alignment along a corridor or the like, wherein (a) a housing is located above each door and each door is roller suspended via its own carriage and rides a rail which extends horizontally in each housing, (b) a reversible electric motor drive is within each housing for selectively moving the associated door between open and closed positions, (c) a movable emergency release bar extends from the remote control station and through each housing, (d) a vertical locking head is adjacent each door and is connected to a bolt engageable with the associated door to hold the door in closed position, (e) a pivotal deadlock prevents vertical movement of said locking head while said bolt is holding the door in closed position, and (f) means carried by said release bar at each door is provided for operating said locking head for each door thereby unlocking all of said cell doors simultaneously; the improvement in which, at each cell-door location: (g) said deadlock means is pivotally mounted to a slide bar carried by said carriage and having limited horizontally guided lost-motion engagement to said carriage, said deadlock means at one limit of said lost-motion engagement having deadlock action to foreclose locking-head displacement from door-bolting position, and said deadlock means at the other limit of said lost-motion engagement having no deadlock relation with said locking head; (h) cam means on said slide bar coacts with said locking head for displacing the same out of door-bolting position, such coaction being in the course of slide-bar movement from said one to said other limit of said lost-motion engagement; and (i) said motor means is mounted to said slide bar and has an output shaft connected to drive at least one roller of said suspension; whereby, starting with a deadlocked bolted and closed condition of said door, and upon motor excitation in one direction, said one roller is driven to displace said slide bar from said one to said other limit of the lost-motion engagement, thereby unbolting said door so that, after reaching said other limit of the lost-motion engagement, continued motor drive in said one direction is operative to drive said carriage in any opening displacement of the door; and further whereby, starting with an open condition of said door, and upon motor excitation in the opposite direction, said roller may be first driven to displace said slide bar from said other to said one limit of the lost-motion engagement and continued motor drive in said opposite direction is operative to drive said carriage in a closing displacement of the door, with said cam means returning the locking head to door-bolting and dead-locked condition upon completion of the door-closing displacement.

4,897,960
RAILROAD CROSSING GATE
Todd A. Barvinek, and James W. Jensen, both of Linn County, Iowa, assignors to General Signals, Inc., Evansville, Iowa
Filed Jan. 3, 1989, Ser. No. 292,928
Int. Cl.[4] E01F *13/00;* E05D *15/52*
U.S. Cl. 49—49 5 Claims



1. A crossing gate for selectively blocking vehicular traffic across a railroad grade crossing, said crossing gate comprising: means for mounting said crossing gate for movement in a generally vertical plane from an upright position not blocking the crossing to a lowered position blocking the crossing, an arm extending outwardly from the mounting means in a direction generally perpendicular to the direction of movement of the vehicular traffic, means combined with said arm and said mounting means and providing for swingable movement of said arm from a position blocking the crossing when force is applied to the arm and providing for return of the arm to its original position blocking the crossing when the force is removed, said arm having at least one translucent portion, means for providing light located inside of the arm behind the translucent portion, and a cushion support for the light providing means.

4,897,961
RELEASABLE MOUNT FOR WINDOW GRILLES
Jerry P. Shine, 10451 Isleworth Ave., San Diego, Calif. 92926
Filed Oct. 17, 1988, Ser. No. 258,600
Int. Cl.[4] E05B *65/10*
U.S. Cl. 49—141 16 Claims

1. A releasable mount for mounting a window grille over a window, the mount comprising:

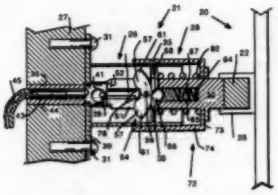
a fixed housing having a base end adapted for rigid attachment to a wall adjacent to the window, and an open end directed outwardly away from the wall,

a latch member mounted inside the fixed housing, the latch member having an opening therethrough,

a latch pin adapted to be rigidly connected to the window grille, and adapted to be received through the open end of the fixed housing and the opening in the latch member, to a latched position, the grille being in the desired mounted position over the window when the latch pin is in the latched position,

catch means mounted in a cavity inside the latch pin and being adapted for movement between a retracted position and an expanded position, for preventing the latch pin from being withdrawn from the latched position when in the expanded position, and for enabling the latch pin to be inserted and withdrawn from the fixed housing when in the retracted position,

a trigger pin mounted in the fixed housing with one end extending between the base end of the fixed housing and



the latch member, the trigger pin being adapted for movement between a cocked position, and a release position relatively further away from the latch member, and being biased by a biasing means in the cocked position, the trigger pin, when in the cocked position, being adapted to contact the catch means mounted on the latch pin when the latch pin is inserted into the fixed housing to the latched position, said contact causing the catch means to expand to the expanded position, and, the trigger pin, when in the release position, being adapted to enable the catch means to retract to the retracted position so that the latch pin may be withdrawn from the fixed housing, and

remote actuating means connected to the trigger pin for enabling a person inside the building to move the trigger pin from the cocked position to the release position, thereby enabling the latch pin to be withdrawn from the latched position.

4,897,962

DOOR APPARATUS

Mitaru Itoh, No. 2-6, Inohana 3-chome, Chiba-shi, Chiba-ken, Japan

Filed Jun. 23, 1988, Ser. No. 210,693

Claims priority, application Japan, Oct. 2, 1988, 63-29735

Int. Cl.[4] E05D *15/56*

U.S. Cl. 49—208 **1 Claim**

1. A door apparatus, comprising:

a frame having a rectangular main frame and sub-frames which expand along a vertical direction of said main frame and extends integrally from said main frame;

a door having a predetermined width, said door being fitted into said frame;

at least one door support shaft which vertically extends in at least one of an upper and lower center of said door in a transverse direction;

a main shaft means for rotatably supporting each door support shaft inside a vertical portion of said main frame;

at least one support arm being extended from at least one of an upper and a lower end portion of said main shaft;

each door support shaft being rotatably supported at a tip of each of said support arms;

at least one vertical support shaft being disposed at a position in said sub-frames where lines connecting axes of said vertical support shaft, said main shaft and said door support shaft substantially form a triangle;

at least one horizontal rocking rod having an elongated hole which extends from a tip of a substantially centered portion of said horizontal rocking rod within a longitudinal direction and into which said door support shaft slidably fits;

said horizonal rocking rod being rotatably supported in the horizontal direction at a base end portion by said vertical support shaft;

at least one rotation limit plate having a tip equipped with a notch groove extending along said elongated hole of said horizonftal rocking rod and having a predetermined width;

said door support shaft having a reduced portion which is fitted into said notch groove;

said rotation limit plate further includes a frame portion into which said horizontal rocking rod is fitted slidably;

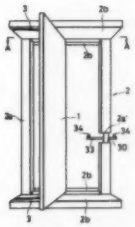
a bias spring for urging said rotation limit plate in such a manner that the tip of said rotation limit plate is always in contact with said door support shaft;

at least one rotary shaft being disposed inside said sub-frame on an opposite side to said vertical support shaft;

at least one first small gear being fixed to said rotary shaft;

at least one disc means for rocking said support arm through a connecting rod, said disc means being fixed to said rotary shaft and having a predetermined diameter;

at least one first pin being implanted at an eccentric position of said disc means;



at least one second pin being implanted substantially at the center of said support arm in a longitudinal direction;

said connecting rod being fitted between said first pin and said second pin;

at least one second small gear being fitted to a second rotary shaft for meshing with said first small gear, said second small gear having a diameter substantially twice that of said first small gear;

at least one third pin being implanted to an eccentric position of said at least one second small gear;

at least one other rotary shaft having fixed thereto a third small gear having a diameter substantially equal to that of said first small gear and a second disc having a diameter substantially equal to that of said second small gear;

at least one fourth pin being implanted to an eccentric position of said second disc;

at least one other connecting rod being fitted between said third pin of said second small gear and said fourth pin; and

an operation shaft equipped at the upper and lower end portions thereof with at least one fourth small gear for meshing with said third small gear and having substantially the same diameter as that of said first small gear, and having a fitting hole at a substantially centered portion for fitting an operation rod;

said operation shaft being rotatably supported inside a vertical portion of said main frame on an opposite side of said main shaft;

said operation rod being equipped with knobs at both end

portions of said operation rod and slidably inserted through said fitting hole of said operation shaft.

4,897,963

CONNECTOR DEVICE FOR TWO REACTOR CONTAINMENTS

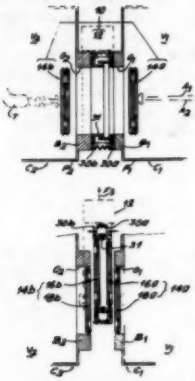
Michel Reboul, Landun, and Charles Glachet, Vendome, both of France, assignors to Commissariat A L'Energie Atomique, Paris and Euritech, Vendome, both of, France

Filed Oct. 4, 1988, Ser. No. 252,923

Claims priority, application France, Oct. 15, 1987, 87 14250

Int. Cl.[4] G21C *19/00*; G21F *7/00*

U.S. Cl. 49—507 14 Claims



1. A disconnectable device for connecting two reactor containments each having a connecting opening delimited by a flange, the connecting openings of the two containments being approximately aligned according to a common axis and the flanges being spaced at an approximate given distance, whereby this device comprises:

an assembly to place in communication the connecting openings of the containments in a sealed way with respect to the exterior of the containments, this assembly comprising a reference part provided with immobilization means with respect to the flanges of the cells, two linking parts cooperating with the reference part by means of rotary immobilization means around the axis of the connecting openings, these linking parts cooperating together in a sealed way so as to define an internal passage suitable for connecting the connecting openings, each of the linking parts bearing at least one sealing device suitable for coming to take sealed support on one of the flanges, said assembly finally comprising means to control a relative displacement between the linking parts parallel to said axis, and

at least one double door each formed of two doors kept attached by magnetic devices authorizing a limited relative sliding between the doors, these two doors able to come and be nested in a sealed way respectively inside the connecting opening formed in the flange of one of the containments and the passage formed in the adjacent linking part when said assembly ensures a sealed communication between the containments.

4,897,964

GRINDING MACHINE WITH DRESSING APPARATUS AND METHOD OF DRESSING GRINDING WHEELS THEREIN

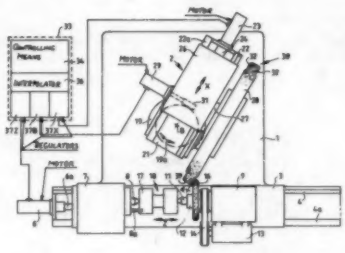
Ulrich Vetter, Stuttgart, Fed. Rep. of Germany, assignor to Schaudt Maschinenbau GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 22, 1988, Ser. No. 275,122

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1987, 3740199

Int. Cl.[4] B24B *7/00*

U.S. Cl. 51—5 D 6 Claims



1. A grinding machine comprising a wheelhead having at least one rotary grinding spindle and at least one grinding tool provided on said spindle and having a working surface; a dressing apparatus including a dressing tool; drive means for changing the positions of said spindle and said apparatus relative to each other in the direction of two axes which are inclined relative to each other; means for changing the orientation of said tools relative to each other while said dressing tool contacts and dresses said working surface, including means for changing the orientation of said spindle, said orientation changing means comprising means for turning said spindle about an axis which is remote from the point of contact between the working surface and said dressing tool; and means for controlling said drive means and said orientation changing means as a function of the profile of the working surface of said grinding tool, including means for compensating for deviations of movement of said tools in the directions of said two axes during dressing of said working surface as a result of changes of orientation of said spindle.

4,897,965

KNIFE SHARPENING APPARATUS

Daniel D. Friel, P.O. Box 4319, Greenville, Del. 19807

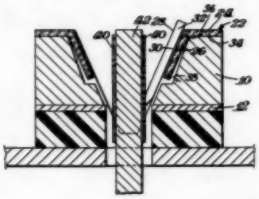
Continuation-in-part of Ser. No. 917,601, Oct. 6, 1986, Pat. No. 4,807,399, which is a continuation-in-part of Ser. No. 588,794, Mar. 12, 1984, Pat. No. 4,627,194, and Ser. No. 855,147, Apr. 23, 1986, Pat. No. 4,716,689, which is a continuation-in-part of Ser. No. 588,795, Mar. 12, 1984, abandoned. This application Jan. 31, 1989, Ser. No. 304,323

Int. Cl.[4] B24B *3/54*

U.S. Cl. 51—128 7 Claims

1. In a knife sharpening apparatus for sharpening a knife having a face terminating at a cutting edge facet, comprising a sharpening member having a moving abrasive surface, said abrasive surface being in a plane, means to impart motion to said abrasive surface, magnetic knife quide means having a magnetic guide surface lying in a plane disposed at a predetermined angle to and intersecting said plane of said abrasive surface to form a line of intersection therewith, the improvement being in that said magnetic knife guide means is composed of a magnetized material having opposite polarity north and south magnetic pole faces with a first ferromagnetic member located substantially against one magnetic pole face and a second ferromagnetic member, said second ferromagnetic member having one portion which lies in one plane and a

second portion which lies in an intersecting plane, said second ferromagnetic member being located in part against the other magnetic pole face where a portion of the second ferromagnetic member extends finitely in a direction parallel to the plane of the magnetic guide surface and essentially contiguous to the magnetized material, said second member being disposed



along a portion of said magnetic guide surface remote from said abrasive surface, and said first of said ferromagnetic members being located along a portion of said magnetic guide surface which is contiguous to said abrasive surface to create a magnetic field along said magnetic guide surface to hold the knife against said magnetic guide surface and move the knife therealong into engagement with said moving abrasive surface.

4,897,966

POLISHING APPARATUS

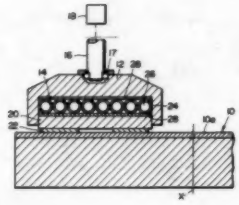
Yutaka Takahashi, Noda, Japan, assignor to Japan Silicon Co., Ltd. and Mitsubishi Kinzoku Kabushiki Kaisha, both of Tokyo, Japan

Filed Aug. 18, 1987, Ser. No. 87,167

Claims priority, application Japan, Aug. 19, 1986, 61-193781; Dec. 4, 1986, 61-289446

Int. Cl.[4] B24B *37/04*

U.S. Cl. 51—131.3 **2 Claims**



1. An apparatus for polishing one of opposite faces of a slab member comprising:

(a) a surface plate having a flat upper surface and being rotatable about an axis perpendicular to said upper surface;

(b) a mounting member having an upper face and a lower face to which the other face of said slab member is fixedly secured, and said mounting member being disposed above said surface plate in such a manner that said one face of the slab member to be polished is held in contact with said upper surface of the surface plate;

(c) urging means operably connected to said mounting member for urging said mounting member toward said surface plate at a prescribed urging pressure to bring said one face of the slab member into pressure contact with said upper surface of said surface plate; and

(d) pressure transmitting means interposed between said mounting member and said urging means for causing the urging pressure of said urging means to be exerted on said upper face of said mounting member, said transmitting means comprising a mounting head connected to said urging means and having a recess formed in a lower face thereof, and a flexible container containing a fluid therein and housed in said recess of said mounting head with an upper surface thereof being held in contact with an inner surface of said recess while a lower surface of said container is held in contact with said upper face of said mounting member;

said flexible container comprising an elongated tube having upper and lower faces and being wound in a vortical form and having opposite closed ends, said upper and lower faces of said elongated tube being secured by top and bottom seats of resilient material, respectively.

4,897,967

APPARATUS FOR TRUING A GRINDING WHEEL

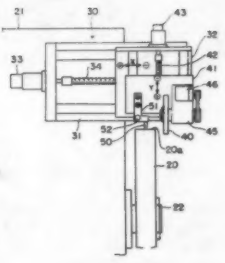
Toshio Maruyama; Yukio Oda, both of Kariya, and Syoji Yamaguchi, Nagoya, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Jan. 23, 1987, Ser. No. 6,162

Claims priority, application Japan, Jan. 23, 1986, 61-12800

Int. Cl.[4] B24B *49/00*

U.S. Cl. 51—165.87 **5 Claims**



1. An apparatus for truing a rotatably supported grinding wheel having a grinding surface at its outer circumferential portion thereof, comprising:

a truing head movable relative to said grinding wheel in a first direction parallel to said grinding surface of said grinding wheel and in a second direction perpendicular to said first direction;

a truing tool supported on said truing head;

a contact detection member secured to said truing head and engageable with said grinding surface of said grinding wheel;

a contact detection device for generating a contact signal when said contact detection member is brought into contact with said grinding surface of said grinding wheel through relative movement between said truing head and said grinding wheel in said second direction;

gap memory means for storing a gap between edges close to said grinding wheel of said truing tool and said contact detection member in said second direction;

first and second feed means for effecting relative movement between said truing head and said grinding wheel in said first and second directions, respectively; and

a feed control device for controlling, in response to said contact signal from said contact detection device and based on said gap stored in said gap memory means, said first and second feed means in accordance with a predetermined cycle so as to true said grinding wheel, said feed control device including:

first feed control means operable when said edge of said truing tool is in alignment with said grinding surface of said grinding wheel upon completion of a previous truing operation, for moving said truing head relative to said

grinding wheel in said second direction until said contact signal is generated;

gap detection means for detecting a distance through which said truing head is moved relative to said grinding wheel under the control of said first feed control means; and

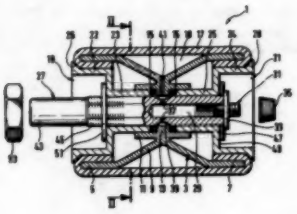
data setting means for storing said distance detected by said gap detection means in said gap memory means so as to renew said gap stored therein for use in positioning said truing tool relative to said grinding wheel in a subsequent truing operation.

4,897,968

INFLATABLE GRINDING ROLLER

Heinz Hutt, 472 Place Closse, Ile Bizard, Quebec, Canada H9C 1Y6

Filed Sep. 26, 1988, Ser. No. 249,493
Int. Cl.[4] B24D 9/02
U.S. Cl. 51—373 **14 Claims**



1. An inflatable roller for use to mount a cylindrical abrasive element, said roller comprising:

a hollow cylindrical sleeve support having a concave center section including a bore section provided, intermediate its ends, with an inner radial shoulder dividing said bore section into two angular corners;

a packing ring in each of said corners;

an elastic sleeve fitted over said support; said sleeve having ends inturned over the ends of said support; said sleeve and said concave section defining together an inflatable air chamber;

a pair of cup-like compression members fitted into the ends of said support and constructed for pressing said sleeve inturned ends against said support; said members being formed, at their centers, with axial packing glands entering into said bore section and pressing said packing rings against said radial shoulder;

means for holding said compression members in a pressing position against the inturned ends of the sleeve and against the packing rings;

a mandrel extending through said packing glands, said packing rings and said radial shoulder; said mandrel having a blind bore opening at one end and an air inflation check-valve mounted at said one end, and

wherein said mandrel, said radial shoulder and said concave section are formed with communicating passages for joining together said blind bore and said air chamber.

4,897,969

METHOD AND MEANS FOR TEXTURIZING OBJECTS

Milo G. Balhorn, Waterloo, Iowa, assignor to Masonry Processes, Inc., Atlanta, Ga.

Filed May 2, 1988, Ser. No. 189,107
Int. Cl.[4] B24C 3/12
U.S. Cl. 51—418 **15 Claims**

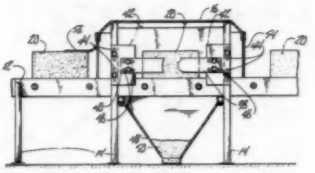
6. A sandblasting unit for texturizing a surface of an object comprising:

a frame;

a housing mounted on the frame;

a nozzle mounted within the housing and being operatively connected to a source of sandblasting particles, the nozzle being adapted to emit a spray of sandblasting particles, the spray having an area of coverage and being concentrated in a central locale within the coverage area;

means for moving the object through the housing and thereby exposing the surface of the object to the spray; and



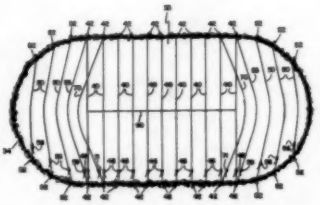
means located between the nozzle and the object for blocking the spray in the central locale so as to eliminate the concentration of spray therein allowing only a peripheral portion of the spray to reach the surface of said object and thereby produce uniform texturizing of the surface of the object said blocking means comprising an elongated member extending into said housing and having an imperforate exposed end and a longitudinal axis of symmetry which intersects the central locale.

4,897,970

METHOD OF COVERING AND SECURING MATERIAL

Paul B. Double; Frederick W. Orr, both of Winona, Minn., and Robert E. Dotterwick, Fountain City, Wis., assignors to Canamer International, Inc., Winona, Minn.

Filed Aug. 18, 1988, Ser. No. 234,016
Int. Cl.[4] E04D 1/34
U.S. Cl. 52—4 **11 Claims**



1. A method of covering and securing to the ground a generally windrow-shaped stack of material which has a longitudinal crest having first and second ends, a base having a perimeter defined by a pair of generally parallel side edges and a pair of generally semi-circularly shaped end edges, longitudinal sides sloping downwardly and laterally outwardly from the crest toward the side edges of the base, and first and second ends sloping downwardly and radially outwardly from each respective end of the crest toward the end edges of the base, the method comprising the steps of:

(a) covering the entire surface of the stack with a flexible cover sheet having a rim portion;

(b) extending the rim portion of the cover sheet along the ground surface surrounding the stack of material;

(c) laying ballast material over substantially the entire length of the rim portion of the cover sheet to force the rim portion into generally abutting engagement with the ground to prevent the influx of wind and moisture;

(d) establishing a plurality of side anchors with respect to the ground, with the side anchors longitudinally spaced generally uniformly along the side edges of the base and

aligned in opposed lateral pairs on opposite sides of the stack of material;

(e) laying a plurality of adjustable length, generally flat side straps laterally over the sides of the stack of material, in generally parallel relation and across the crest thereof;

(f) securing the ends of each flat side strap to the side anchors of a respective one of each of the opposed pairs of side anchors;

(g) shortening the length of each flat side strap to tighten the flat side strap down onto the cover sheet over the sides and crest of the stack of material;

(h) establishing a plurality of end anchors with respect to the ground with the end anchors longitudinally spaced generally uniformly along the end edges of the base and aligned in opposed lateral pairs on opposite sides of the ends of the stack of material;

(i) laying a plurality of adjustable length, generally flat first end straps generally laterally over the ends of the stack of material;

(j) securing the ends of each flat first end strap to the end anchors of a respective one of each of the opposed pairs of end anchors;

(k) shortening the length of each flat first end strap to tighten the flat first end strap down onto the cover sheet over the ends of the stack of material;

(l) laying at least one adjustable length, generally flat second end strap generally laterally over each end of the stack of material adjacent its respective end of the crest of the stack of material;

(m) securing the ends of each flat second end strap to the side anchors of the first opposed pair of side anchors along each side edge of the base; and

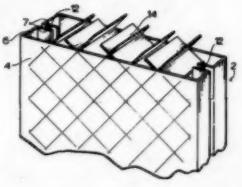
(n) shortening the length of each flat second end strap to tighten the flat second end strap down onto the cover sheet over the end of the stack of material adjacent its respective end of the crest of the stack of material.

4,897,971

WASHROOM PARTITION

Gordon G. Durston, Belmont, Canada, assignor to GSW Inc., Toronto, Canada

Filed Oct. 24, 1988, Ser. No. 261,313
Int. Cl.[4] E04C 2/40
U.S. Cl. 52—35 **14 Claims**



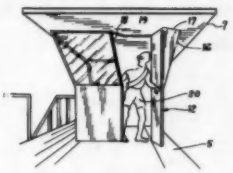
1. A fabricated metal toilet stall panel comprising opposed metal panel sheets, each panel sheet has a flat face bordered by flanged edges which cooperate to define an essentially hollow core, said panels at said flanged edges including an inwardly directed sealing flange generally parallel to the respective flat face and in abutting opposed relation with the like sealing flange of the opposed panel sheet, said metal panels being secured to each other by an adhesive seal between said sealing flanges.

4,897,972

OBSERVATION TOWER

David J. Stollery, 3203 Bern Ct., Laguna Beach, Calif. 92651

Filed May 22, 1989, Ser. No. 355,504
Int. Cl.[4] E04H 1/12
U.S. Cl. 52—94 **14 Claims**



1. A tower-like enclosure having at least one nonvertical peripheral window with a substantially transparent pane, and at least one door and a generally quadrangular door jamb structure adjacent to one of said window panes, the improvement comprising:

a first door jamb section attached parallel and adjacent to a nonvertical edge of said one window pane;

an opposing generally vertical door jamb section attached to said enclosure.

a first door panel section generally in a vertical plane;

a second generally vertical door panel section attached to and angled away from the plane of said first door panel section and generally extending from said first door panel section to said first door jamb section when said door is closed; and

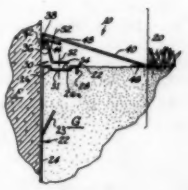
means for hingably attaching a vertical edge of said first door panel section to said opposing door jamb.

4,897,973

MODULAR SUN BLOCK SYSTEM

William A. Foster, Jr., Baltimore, Md., and Vincent S. Pedrick, 1637 Riverwood Rd., Baltimore, Md. 21221, assignors to Vincent S. Pedrick, Baltimore, Md.

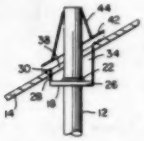
Filed Feb. 16, 1988, Ser. No. 155,859
Int. Cl.[4] E02D 27/00
U.S. Cl. 52—102 **6 Claims**



1. Structure for inhibiting vegetative growth on the ground adjacent a foundation comprising the combination of a plurality of angle pieces for anchoring the structure to the ground adjacent the foundation, each of said angle pieces having a short angle arm and a long angle arm with the short angle arm extending generally perpendicular to said long angle arm and having stiffening means located thereon, an elongated tread having a flange with a hook portion located thereon and means for detachably affixing the plurality of angle pieces to the elongated tread in spaced relation to each other on assembly, said means for detachably affixing the plurality of angle pieces to the elongated tread including a plurality of spring clips each having a portion thereof shaped to be located on one of said angle pieces and means for securing each spring clip to one of said angle pieces, each said spring clip having at least one hook thereon oriented and located for springing into engagement in

assembly with an adjacently located hook portion located on the flange of said elongated tread.

4,897,974
VENT PIPE ROOF MOUNT
Byron D. Lane, Hwy. 2, Box 257, Sawyer, N. Dak. 58781
Filed Jan. 4, 1989, Ser. No. 293,354
Int. Cl.[4] E04B 7/00
U.S. Cl. 52—199 **7 Claims**



1. A roof mount for supporting a vertically disposed tubular member from an inclined roof in which the tubular member extends through an opening in the roof that is larger than the tubular member and includes an upper edge and a lower edge, said roof mount comprising a substantially flat plate having a central opening through which the tubular member extends, said central opening including a plurality of inwardly extending tabs attached to the plate around the periphery of the opening and extending radially inwardly, said tabs being constructed of sheet material having substantial rigidity but sufficient flexibility and resiliency to be deflected by insertion of the tubular member through the opening for frictionally engaging and supporting the tubular member from the plate, and means at opposite edge portions of the plate to support the plate from the upper and lower edges of the opening through the roof with the plate being substantially horizontally disposed and the central opening in alignment with the opening in the roof thereby positioning the tubular member in the opening in the roof in spaced relation to the periphery of the opening in the roof, said means supporting the plate from the lower edge of the opening in the roof including an upwardly extending flange integral with the edge of the plate in alignment with the lower edge of the opening in the roof with the flange extending upwardly through the opening in contact with the lower edge of the opening and a laterally extending flange at the upper end of the upwardly extending flange with the laterally extending flange extending onto and engaging the top surface of the roof adjacent the lower edge of the opening and fastening means extending through the flange resting against the upper surface of the roof for securing the roof mount to the lower edge of the opening in the roof.

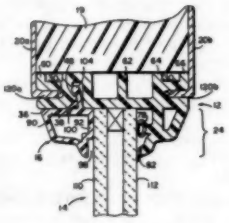
4,897,975
INTEGRAL DOOR LIGHT WITH GLAZING STOP
Kert E. Artwick, Holland; Steven R. Wilkening, Wyoming, both of Mich., and Leslie L. Pallin, Prescott, Wis., assignors to ODL, Incorporated, Zeeland, Mich.
Filed Oct. 23, 1987, Ser. No. 113,739
Int. Cl.[4] E06B 3/58
U.S. Cl. 52—208 **13 Claims**

1. A door light comprising:

a rectangular frame including a plurality of one piece extruded members each being generally identical in cross section, each of said frame members including a body portion having an interfit means for interfitting with portions of a door to support said frame within the door, said body portion including a channel having a bottom, said channel being at least as deep as it is wide, each of said frame members further including a resiliently flexible seal portion extruded with said body potion, said seal portion having a durometer hardness lower than the durometer hardness of said body portion;

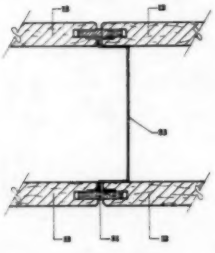
a glazing panel abutting said seal portion to seal said glazing panel about substantially the entire periphery of said frame; and

a plurality of extruded glazing retainers snap-pressed within said frame, one glazing retainer being provided for each of said frame members, each of said glazing retainers including a body portion abutting said glazing panel to entrap said glazing panel in a position abutting said seal portion, each of said glazing retainers further including bias means



for biasing said glazing retainer against said glazing panel to bias said glazing panel against said frame seal portion, said bias means including a spring flange extending from said body portion into said channel and terminating in an edge, said spring flange being longer than it is thick, said channel being wider than said flange is thick whereby said flange can move laterally within said channel, said bias means including a retainer means at said flange edge for retaining said spring flange within said channel, said spring flange being pivotal about said retaining means, whereby said flange can move within said channel to move said retainer body toward said glazing panel.

4,897,976
BUILDING ENCLOSURE ASSEMBLIES
Mark F. Williams, and Barbara L. Williams, both of 945 Tennis Ave., Maple Glen, Pa. 19002
Division of Ser. No. 206,885, Jun. 15, 1988, now Defensive Publication No. 4,833,849. This application Dec. 16, 1988, Ser. No. 285,724
Int. Cl.[4] E04B 2/00
U.S. Cl. 52—281 **3 Claims**



1. A hollow, floor-to-ceiling wall partition comprising two opposite and parallel walls constructed with a building enclosure assembly comprising, in combination,

(a) a plurality of gypsum-based floor, wall or ceiling panel members with a shouldered groove of stepped cross-sectional profile longitudinally rabbeted into at least one edge of said panel member, said shouldered groove comprising two distinct groove sections of distinct depths and widths,

wherein a first groove section is of shallower depth and narrower width than a second groove section which is contiguous with the first groove section;

(b) a generally channel-shaped support means having a web portion and side portions with a substantially L-shaped flange member comprising a leg and a foot, extending by said leg from a side portion of said support means and terminating in the foot which is substantially perpendicularly disposed relative to the web portion of the support means; and

(c) a fire-resistant spline;

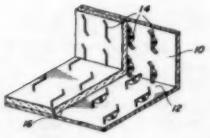
where adjacent pairs of said panel members are articulated by the inter-engagement of said L-shaped flange member and said spline with said shouldered grooves in the edges of adjacent panel members, the foot of said L-shaped flange member nesting into said first groove section and being retained therein by the nesting of a portion of the spline into said second groove section, whereby said spline completely spans over the foot of said L-shaped flange member, and a second panel member is articulated adjacent said first member by the nesting of the remaining portion of said spline into the second groove section in the edge of said second panel member wherein said walls are built upon a floor track within which is contained utility service wiring, comprising, in combination, spaced sections of substantially U-shaped, upwardly opened floor channel having a web portion and side portions with side flanges extending perpendicularly from said side portions, and support means having a substantially L-shaped flange member extending from each said portion of said support means, where said support means is nested into the upwardly opened floor channel sections and carried by the side flanges of the floor channel sections, whereby the feet of the L-shaped flange members of the support means project upwardly and perpendicular to the floor, and engage a first groove section formed in a bottom edge of a panel member.

4,897,977

S-BAR REFRACTORY ANCHORS WITH ELLIPTICAL TAB

Gary L. Page, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Nov. 21, 1988, Ser. No. 274,513
Int. Cl.[4] E04B 1/24; E04C 2/04
U.S. Cl. 52—378 **2 Claims**



1. In a metal refractory anchor formed from a sheet of metal and having a bottom edge, a body section extending from said bottom edge to a top section, an arm extending from each end of said top section such that the top of each of said arms is the same height above the plane of said bottom edge as is the top edge of said top section, said extending arms being bent in opposite directions to the approximate shape of the letter S, and at least one projecting tab formed in the body section thereof, the improvement wherein:

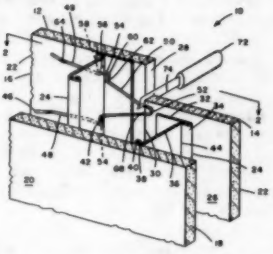
said projecting tap is formed in a generally elliptical shape with two long sides and two ends wherein one of said long sides and both ends of said tab extend from said body section and a portion of the other of said long sides of said tab forms a juncture of said tab and said body portion, whereby the portion of said tab connected to said body section has a length less than the end-to-end dimension of said tab.

4,897,978

PANEL EDGE ALIGNMENT CLIP

Robert J. Menchetti, Buffalo, N.Y., assignor to National Gypsum Company, Dallas, Tex.

Filed Nov. 21, 1988, Ser. No. 273,524
Int. Cl.[4] E04F 13/04
U.S. Cl. 52—363 **20 Claims**



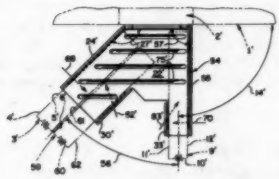
1. A panel edge alignment clip comprising a single length of relatively rigid wire formed to include two somewhat parallel legs engageable in holes in a rigid building framing element, which said framing element has a pair of spaced apart small holes of a size larger than said wire's size, and a head whereat said two legs are adjoined, each said leg having a foot end portion and a head end portion and therebetween an intermediate portion, said intermediate portions of said two legs all lying within a single general plane, at least one of said legs having an intermediate bend within said intermediate portion of sufficient magnitude to engage the periphery of one of said pair of holes when said legs are extended through said spaced apart small holes, and to thereby cause rotation of the clip head around said intermediate bend when said head is caused to move within said general plane of said clip.

4,897,979

MULTIPLE WOOD TRUSS CONNECTION

Karen W. Colonias, Lafayette, Calif., assignor to Simpson Strong-Tie Company, Inc., San Leandro, Calif.

Division of Ser. No. 227,727, Aug. 3, 1988. This application Jun. 30, 1989, Ser. No. 374,431
Int. Cl.[4] E04B 1/38
U.S. Cl. 52—643 **3 Claims**



1. In a multiple wood truss connection including:

a. a carrying wood truss girder having a vertical wood king post member;

b. a first carried wood hip truss having a wood bottom chord member having first and second sides and a bottom edge and said first carried wood hip truss is disposed at an angle to said carrying wood truss girder of less than 90°;

c. a second carried wood hip truss having a wood bottom chord member having first and second sides and a bottom edge and said second carried wood hip truss is disposed in side by side relation with said first carried wood hip truss;

d. a carried wood jack truss having a wood bottom chord member having first and second sides and a bottom edge

and said carried wood jack truss is disposed at an angle to said carrying wood truss girder of approximately 90°;

e. the improvement including a metal connector comprising:

(1) a common seat member;

(2) a hip seat member extending from said common seat member for receiving said bottom edges of said bottom chords of said first and second carried wood hip trusses;

(3) a hip sidewall connected to and disposed at an angle of generally 90° to said common seat member and said hip seat member for receiving said first side of said wood bottom chord of said first carried wood hip truss;

(4) a first back member connected to and disposed at an angle to said hip side wall along a first back bend line, and said first back member is formed with a plurality of fastener holes therethrough;

(5) a hip tab connected to and disposed at an angle of generally 90° to said hip seat member and laterally disposed from said hip sidewall for receiving said second side of said wood bottom chord of said second carried hip truss;

(6) a jack seat extending from said common seat member for receiving said bottom edge of said bottom chord of said carried wood jack truss;

(7) a jack tab connected to and disposed at an angle of generally 90° to said jack seat for receiving said first side of said bottom chord of said carried wood jack truss;

(8) a jack sidewall connected to and disposed at an angle of generally 90° to said common seat member and said jack seat member, and disposed at an angle of generally less than 90° to said hip sidewall, for receiving said second side of said wood bottom chord of said carried wood jack truss;

(9) a second back member connected to and disposed at an angle to said jack side wall along a second back bend line, and said second back member is formed with a plurality of fastener holes, at least one of which is in registration with one of said fastener holes in said first back member, and said second back member is disposed in overlapped registration with said first back member;

f. fastener means dimensioned for insertion through said fastener holes in said first and second back members and into said vertical wood king post member of said carrying wood truss girder;

g. hip sidewall fastener means joining said hip sidewall of said metal connector and said wood bottom chord of said first carried wood hip truss;

h. hip tab fastener means joining said hip tab to said wood bottom chord of said second carried wood hip truss;

i. jack tab fastener means joining said jack tab to said bottom wood chord of said carried wood jack truss; and

j. jack sidewall fastener means joining said jack sidewall to said wood bottom chord of said carried wood jack truss.

4,897,980

APPARATUS FOR FORMING A BULK PACKAGE

Joseph E. Geyser, Brentwood, and Nestor Kozbur, Antioch, both of Calif., assignors to James River Corporation, Oakland, Calif.

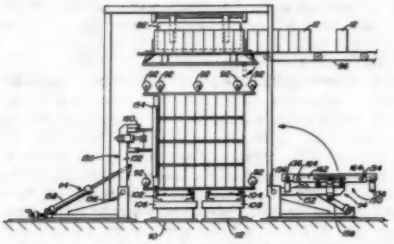
Filed Jun. 5, 1989, Ser. No. 360,484
Int. Cl.[4] B65B *11/00, 35/50, 61/20*
U.S. Cl. 53—128 **20 Claims**

1. Apparatus for forming a bulk package, said bulk package including objects stacked in layers with each layer comprising a plurality of said objects disposed in rows, a bottom tray disposed under the lower-most layer, a top cap disposed over the upper-most layer, and a plurality of elongated post members extending between the bottom tray and the top cap, said apparatus comprising, in combination:

bottom tray placement means for placing the bottom tray on a support;

stacking means for stacking said layers of objects on said bottom tray after placement of said bottom tray on said support;

top cap positioning means for positioning said top cap over the upper-most layer of objects after said stacking means has stacked said layers of objects; an



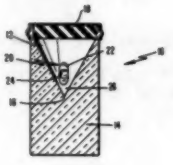
post member positioning means for positioning post members at preselected spaced locations between said bottom tray and top cap.

4,897,981

METHOD OF PACKAGING INTRAOCULAR LENSES AND CONTACT LENSES

Robert E. Beck, Fort Worth, Tex., assignor to Alcon Laboratories, Inc., Fort Worth, Tex.

Filed Dec. 24, 1986, Ser. No. 946,346
The portion of the term of this patent subsequent to Apr. 19, 2005, has been disclaimed.
Int. Cl.[4] B65D *81/22*
U.S. Cl. 53—431 **5 Claims**



1. A method of packaging intraocular lenses and contact lenses, which comprises:

placing a lens and a physiologically acceptable fluid in a lens compartment of a container, said compartment having a conical configuration with its apex oriented downwardly towards the bottom of the container so that the lens assumes a substantially vertical position when placed therein, and sealing the container.

4,897,982

PLASTIC LINED PACKAGING

Victor S. Day, Spofford, N.H., and David A. Collette, Greenfield, Mass., assignors to Fulflex International Co., Limerick, Ireland

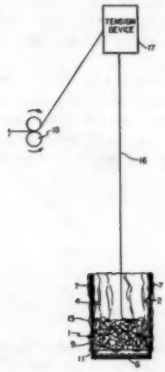
Filed Oct. 17, 1988, Ser. No. 258,563
Int. Cl.[4] B65D *85/16;* B65B *1/04*
U.S. Cl. 53—449 **4 Claims**

1. A method for discharging elastic material from a container at high speed without tugging or trapping of the elastic material, the method comprising:

providing a container sized and shaped for the transport and discharge of elastic material;

placing a bag liner loosely within the container, the liner composed of a plastic material which reduces friction

between the elastic material and the sidewalls while providing air pockets for even packing along the sidewalls;



filling the lined container with the elastic material; and, pulling the elastic material out of the lined container.

4,897,983

WRAPPER FOR TUBULAR PRODUCTS, ESPECIALLY CHOCOLATE BARS AND METHOD OF MANUFACTURING IT

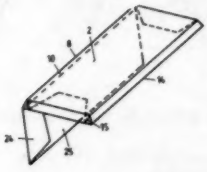
Wilhelm Hogenkamp, Hanover, and Gert Wostbrock, Garbsen, both of Fed. Rep. of Germany, assignors to Otto Hänsel GmbH, Hanover, Fed. Rep. of Germany

Filed Jun. 10, 1988, Ser. No. 205,073

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1987, 3719610

Int. Cl.[4] B65B *7/08, 11/02*

U.S. Cl. 53—461 **6 Claims**



1. A method of manufacturing a wrapper for tabular products, particularly chocolate bars, comprising the steps: wrapping a one-piece rectangular-shaped blank asymmetrically around a bar to produce a facing and a tube-shaped member of wrapping material, forming a longitudinal sealing seam adjacent to one side of said bar and thereby forming an area of said blank projecting beyond said longitudinal sealing seam; wrapping said area against said lower surface of said bar and resting said area against said bar as part of said tube-shaped member; extending said tube-shaped member beyond the ends of said bar including said longitudinal forming bellows at said extended ends which encompass said longitudinal sealing seam as part of said tube-shaped member and forming inner flaps in said projecting area sealing seam; sealing tight said tube-shaped member at both said extended ends by a transverse seal extending over said projecting area and said bellows; opening said tube-shaped member after said sealing step by unfolding said projecting area from said lower surface and folding areas of said tube-shaped member that include said transverse seal and said bellows onto the lower surface of said bar; and refolding thereafter said projecting area back against said lower surface again in form of said facing to cover up areas of said bellows with said facing and securing said projecting area against a portion of said tubular-shaped member at said lower surface, said blank being free of cutouts, said facing being reopenable after said transverse seal.

4,897,984

COIN RECEIVING AND WRAPPING APPARATUS

Hideshi Sentoku, and Takayoshi Asaoka, both of Tokyo, Japan, assignors to Laurel Bank Machines Co. Ltd., Tokyo, Japan

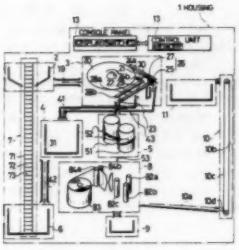
Filed Jun. 27, 1988, Ser. No. 211,577

Claims priority, application Japan, Jun. 30, 1987, 62-163460; Jul. 14, 1987, 62-175617

The portion of the term of this patent subsequent to Jan. 30, 2007, has been disclaimed.

Int. Cl.[4] B65B *11/04, 57/20*

U.S. Cl. 53—501 **4 Claims**



1. A coin receiving and wrapping apparatus comprising:

a housing including

upper hopper means for receiving coins,

discriminating means for discriminating denominations and genuineness of coins received via said upper hopper means and counting the value of genuine received coins,

sorting means for sorting coins having a designated denomination for wrapping,

coin stacking means for receiving coins for wrapping from said sorting means and stacking the coins to make stacks of a predetermined number of coins,

coin wrapping means for receiving said stacks of coins from said coin stacking means and wrapping said stacks with a film material to make cylindrically-wrapped stacks of coins,

wrapped-coin storage means for storing wrapped stacks of coins,

temporary storage means detachably mounted on said housing for temporarily holding the coins sorted by said sorting means and determined to be coins other than those to be wrapped,

safe means for receiving coins from said temporary storage means and storing them therein, said safe means being disposed in said housing and being inaccessible from outside of said housing,

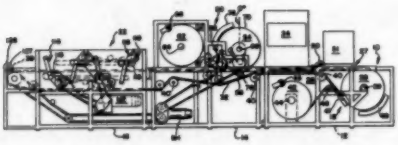
transfer means for transferring coins stored in said safe means to said upper hopper means, and

denomination setting means for setting said sorting means so as to designate a denomination of coins to be delivered to said coin stacking means for wrapping.

4,897,985
CONTINUOUS MOTION PACKAGE FORMING MACHINE

Raymond G. Buchko, Appleton, and John A. Halgren, Neenah, both of Wis., assignors to Curwood, Inc., Appleton, Wis.

Filed Oct. 6, 1988, Ser. No. 254,412
Int. Cl.[4] B65B 9/02, 65/02
U.S. Cl. 53—559 10 Claims

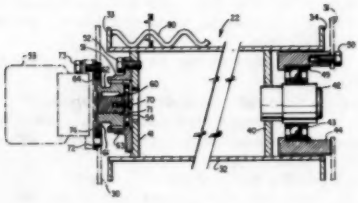


1. A continuous motion procesing machine comprising:
at least one tooling carriage;
drive linkage including a rotatable power input shaft, said linkage being connected to said carriage to move said carriage in a repetitive cyclic path;
processing tooling carried by said carriage adapted to perform processing steps in a processing zone during an increment of said cycle of carriage movement;
means for supplying at least one web to said processing zone at a constant rate of advancement including a first motor having a rotatable output shaft positionable in a plurality of positions during a predetermined distance of web advancement;
control means connected to said power input shaft to move said carriage through said repetitive cyclic path in a predetermined period of time;
said control means further including means to sense specific positions of said shaft of said first motor and to vary speed of rotation of said power input shaft during said predetermined time period in relation to the position of said shaft of said first motor during said predetermined distance of web advancement.

4,897,986
CANE HARVESTER FEED ROLL MOUNTING APPARATUS

Malcolm J. Baker; John G. Williams, and Graham G. Yates, all of Bundaberg, Australia, assignors to Austoft Industries, Ltd., Australia

Continuation of Ser. No. 765,214, Aug. 13, 1985, abandoned. This application Mar. 23, 1988, Ser. No. 175,686
Claims priority, application Australia, Aug. 13, 1984, PG6527; Aug. 13, 1984, PG6526; Aug. 13, 1984, PG6528
Int. Cl.[4] A01D 45/10
U.S. Cl. 56—13.9 5 Claims

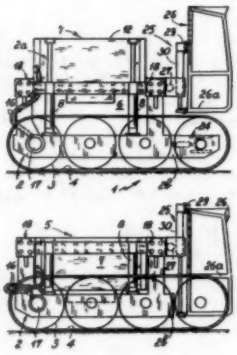


1. In a cane harvester, a feed roller rotatably mounted between two oppositely located frame sections of the harvester by opposed mounting connections, the improvement comprising at least one of the mounting connections comprising a splined adaptor plate mounted to one end of the feed roller about the longitudinal axes thereof and within the transverse width between said frame sections, a motor operable to power said feed roller, a shaft extending from the motor, a second adaptor plate having an opening therethrough and mounted on the outside of one of said frame sections of the harvester about the longitudinal axes of said feed roller with the motor being removably mounted to said second adaptor plate, and pinion means mounted on the shaft, said pinion means having a first end portion removably engaged with the splined adaptor plate and an opposite end portion closely received in the opening in the second adaptor plate, the pinion means being rotatable with the shaft relative to the second adaptor plate and selectively withdrawable through the opening in the second adaptor plate.

4,897,987
MULTIPURPOSE AND SELF-MOVING ARGICULTURAL MACHINE

Pier L. Spalla, Via Santa Maria, 29, I-15032 Borgo San Martino (Alessandria), Italy

Filed Jun. 16, 1989, Ser. No. 367,089
Claims priority, application Italy, Jun. 17, 1988, 21002 A/88
Int. Cl.[4] A01C 23/00
U.S. Cl. 56—16.7 15 Claims



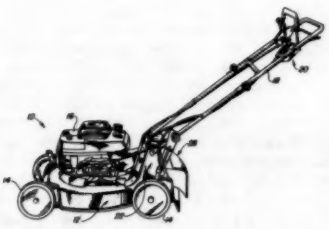
1. Multipurpose and self-moving agricultural machine, comprising:
mobile bearing members (3, 4), defining a direction of movement of said machine,
a frame (2) borne by said mobile bearing members (3, 4) and having a transversal direction, extending transversally to said direction of movement, and a longitudinal direction perpendicular to said transversal direction,
a main engine (7) borne by said frame (2) and acting at least on said mobile bearing members (3, 4),
a plurality of engaging means (31a, 31b) provided on that frame (2) and suitable to engage operative structures for agricultural works,
and an operation and driving place (26) borne by said frame (2);
characterized in that said frame (2) includes engagement means (2a) suitable to bear said main engine (7) alternatively in an upper position, said upper position being substantially above said frame (2), and in a lower position, said lower position being substantially beside said mobile bearing members (3, 4),
driving members (16) being provided between said main engine (7) and said mobile bearing members (3, 4), said driving members being adaptable for both said upper and lower positions of said main engine (7).

4,897,988

LAWN MOWER DISCHARGE OPENING COVER AND DEFLECTOR

Kenneth D. Schweitz, Oconomowoc, and Dean W. Benter, Horicon, both of Wis., assignors to Deere & Company, Moline, Ill.

Filed Feb. 10, 1989, Ser. No. 310,807
Int. Cl.[4] A01D 34/63, 34/70
U.S. Cl. 56—202 21 Claims



1. In a mower usable for cutting material such as grass, the mower having a housing and a material discharge duct opening in the rear of the mower housing, the improvement comprising:

a deflector carried on the mower, for receiving material exiting rearwardly from said duct and re-directing it to the side of the mower, the deflector adapted to move between

a first position spaced from said duct and

a second position covering said duct;

the deflector being comprised of adjoining first and second generally flat material directing surfaces

the first surface sloping downwardly and to the side and the second surface sloping rearwardly and to the side.

4,897,989

METHOD TO PRODUCE THREE-PLY YARN AND FABRIC MADE THEREFROM

Coy J. Gray, Greenwood, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 121,697, Nov. 16, 1987, Pat. No. 4,848,613.
This application Oct. 14, 1988, Ser. No. 257,610
Int. Cl.[4] D02G 1/20, 1/18, 3/04, 3/38
U.S. Cl. 57—239 2 Claims

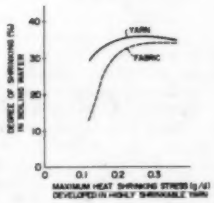
1. The method of producing a three-ply yarn comprising the steps of: supplying a pair of partially oriented synthetic filament yarns, drawing the pair of yarns, supplying the pair of drawn yarns along with a third false twist textured yarn into the air jet, supplying air under pressure into said air jet, commingling the pair of drawn yarns and the false twisted yarn in the air jet and taking up the commingled yarn.

4,897,990

HIGHLY SHRINKABLE SUBSTANTIALLY ACRYLIC FILAMENT YARN

Makoto Nishimura, 2219, Omori-5-chome, Moriyama-ku, Nagoya; Takashi Nonaka, 1012, Kanare-1-chome, Meito-ku, Nagoya; Isao Uenishi, Taun Ishiodai 122-7, 2, Ishiodai-1-chome, Kasugai-shi, and Tamotsu Goto, 4-1-607-103, Iwanaridai-8-chome, Kasugai-shi, all of Japan

Filed Aug. 22, 1988, Ser. No. 234,673
Claims priority, application Japan, Aug. 25, 1987, 62-210814
Int. Cl.[4] D02G 3/02
U.S. Cl. 57—247 8 Claims



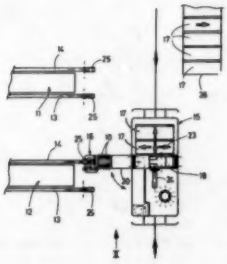
1. A highly shrinkable substantially acrylic filament yarn which exhibits a degree of shrinking of at least 20% in boiling water, a maximum heat shrinking stress of at least 0.15 g/d in a dry heating atmosphere, and a Young's modulus of at least 280 Kg/mm^2 after free shrinking treatment in boiling water.

4,897,991

METHOD AND APPARATUS FOR AUTOMATIC ORDERLY REMOVAL AND COLLECTION OF FULLY-SPUN COPS FROM TEXTILE RING SPINNING MACHINES

Joachim Rohner, deceased, late of Mönchengladbach (by Jutta Rohner, heir); Manfred Langen, Mönchengladbach, and Gregor Gebald, Korschenbroich-Pesch, all of Fed. Rep. of Germany, assignors to Zinser Textilmaschinen GmbH and Innovatex Unternehemensberatung GmbH, both of, Fed. Rep. of Germany

Filed Oct. 28, 1987, Ser. No. 114,874
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1986, 3636654
Int. Cl.[4] D01H 9/18, 9/02
U.S. Cl. 57—281 12 Claims



1. A method for automatically removing and collecting in an orderly manner fully-spun cops from a plurality of textile ring spinning machines, each ring spinning machine being of the type wherein cops are conveyed after doffing by transport means longitudinally along the ring spinning machine to one longitudinal end thereof for collection, said method comprising the steps of providing a movable cart having at least one

removable container adapted for orderly arrangement interiorly therein of a plurality of fully-spun cops, automatically moving said cart to the transport means at the one longitudinal end of each ring spinning machine following a doffing operation thereon, receiving the doffed cops by said cart from said transport means, automatically delivering the received cops to a cop depositing location on said cart, automatically positioning said container in a cop receiving position with respect to said cop depositing location, and automatically depositing the cops at said cop depositing location in orderly arrangement in said container.

5. Apparatus for automatically receiving and collecting in an orderly manner fully-spun cops from a plurality of textile ring spinning machines, each ring spinning machine being of the type having transport means for conveying cops after doffing longitudinally along the ring spinning machine to one longitudinal end thereof for collection, said apparatus comprising a cart automatically movable to the transport means at the one longitudinal end of each ring spinning machine for receiving the doffed cops therefrom following a doffing operation thereon, said cart including: (a) at least one removable container adapted for orderly arrangement interiorly therein of a plurality of fully-spun cops, (b) associated means for automatically deposting cops into said container, (c) means for automatically positioning said container in a cop receiving position with respect to said cop depositing means, and (d) means for automatically receiving and delivering doffed cops from said transport means of said ring spinning machines to said cop depositing means.

4,897,992

METHOD AND APPARATUS FOR TRANSPORTING ROVING BOBBINS IN A SPINNING FACTORY

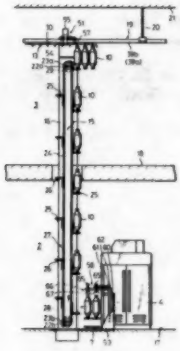
Takashi Kogiso, Mizunami, and Yoshio Kurachi, Aichi, both of Japan, assignors to Howa Machinery, Ltd., Aichi, Japan

Filed Aug. 26, 1988, Ser. No. 237,135

Claims priority, application Japan, Aug. 29, 1987, 62-216049

Int. Cl.[4] D01H *9/18*

U.S. Cl. 57—281 **15 Claims**



1. A method for transporting a plurality of roving bobbins between a floor at which a plurality of roving frames are installed and places for carrying out a roving bobbin exchanging operation before ring spinning frames installed on another floor, said method being applied in a spinning factory wherein roving frames and ring spinning frames are installed on different floors respectively, and bobbin carriages provided with a plurality of bobbin hangers can be transported to said places for carrying out said roving bobbin exchanging operation by means of a guide rail system arranged on a ceiling of said floor on which said ring spinning frames are installed, comprising the steps of:

forming a transporting passage for transporting roving bobbins from specified positions on said floor on which said roving frames are installed to corresponding positions for transferring roving bobbins on said guide rail system,

transporting a plurality of full packaged roving bobbins doffed from roving frames from said transferring positions to said places for carrying out said roving bobbin exchanging operation by displacing said bobbin carriages along said guide rail system, after completion of an operation of transferring full packaged roving bobbins doffed from said roving frames, by displacing said full packaged roving bobbins through said transporting passage,

transporting a plurality of empty roving bobbins created by said roving bobbin exchanging operation from a place whereat said operation was carried out to a desired transferring position by displacing said bobbin carriages along said guide rail system, and then transferring said empty roving bobbins from said bobbin hangers of said bobbin carriages carried to said floor on which said roving frames are installed by transporting said empty roving bobbins taken from respective bobbin hangers of said bobbin carriages carried to said transfer position through said transporting passage,

said transportation of said full packaged roving bobbins through said transportation passage comprising sequential stepwise unit lifting operations of lifting a plurality of pairs of full packaged roving bobbins towards corresponding transfer positions on said guide rail system from corresponding specified positions, with a predetermined identical interval (a) between adjacent pairs of full packaged roving bobbins being longer than a length of said roving bobbin, while maintaining a constant axial distance between each pair of full packaged roving bobbins,

said transportation of empty roving bobbins through said transportation passage downwards comprising sequential stepwise unit operations of displacing said empty roving bobbins downwards, with an interval identical to said interval of said upward transportation of full package roving bobbins, with an axial interval of said pair of empty bobbins being identical to said axial interval of said pair of full packaged roving bobbins during said upward transportation of full packaged roving bobbins.

4,897,993

CLEANING DEVICE FOR OPEN END SPINNING ROTOR

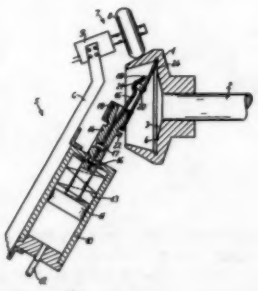
Hans Raasch, and Reinhard Böker, both of Monchen-Gladbach, Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Fed. Rep. of Germany

Filed May 12, 1988, Ser. No. 193,356

Claims priority, application Fed. Rep. of Germany, May 13, 1987, 3715934

Int. Cl.[4] D01H *11/00*

U.S. Cl. 57—302 **5 Claims**



1. A cleaning device for removing debris from an open end spring rotor having a fiber collection groove, said cleaning

device comprising a scraper component adapted for insertion into the fiber collection groove of the rotor, said scraper component having an end portion bent to extend oppositely to the direction of rotation of the rotor, said end portion presenting a forward edge inclined to the direction of rotation of the rotor, and a holder movable toward and away from the fiber collection groove of the rotor, said holder having a rounded end portion, said scraper component having a tubular foot portion for encircling mounting on said rounded end portion of said holder for movement of said scraper component with said holder toward and away from the fiber collection groove of the rotor and for pivotal movement of said scraper component relative to said holder.

4,897,994

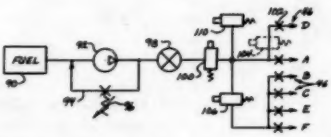
METHOD OF STARTING TURBINE ENGINES

Jack R. Shekleton, San Diego, Calif., assignor to Sundstrand Corporation, Rockford, Ill.

Division of Ser. No. 124,073, Nov. 23, 1987. This application Oct. 3, 1988, Ser. No. 252,586

Int. Cl.[4] F02C *7/22, 7/26*

U.S. Cl. 60—39.06 **3 Claims**



1. A method of starting a small turbine engine having a rotary turbine wheel, a rotary compressor coupled to the turbine wheel, an annular combustor provided with a plurality of angularly spaced fuel injectors and characterized by the absence of start injectors comprising the steps of:

(a) initiating rotation of said compressor and said turbine wheel by applying an external angular accelerating force thereto;

(b) at about 5–10% of rated engine speed, providing fuel to a minority of said injectors while continuing the application of said accelerating force;

(c) after ignition of the fuel introduced during step (b), and when the engine reaches 15–25% of rated speed, introducing fuel into said combustor through the remainder of said injectors while maintaining injection through said minority of injectors; and

(d) thereafter modulating fuel flow through all of said injectors to operate said engine in a desired fashion.

4,897,995

LIQUID TURBOJET ENGINE

Raafat H. Guirguis, 5516 Starboard Ct., Fairfax, Va. 22032

Filed Feb. 26, 1988, Ser. No. 161,156

The portion of the term of this patent subsequent to Mar. 3, 2004, has been disclaimed.

Int. Cl.[4] B63H *11/00*; F02C *3/30*

U.S. Cl. 60—221 **21 Claims**

1. An engine, comprising:

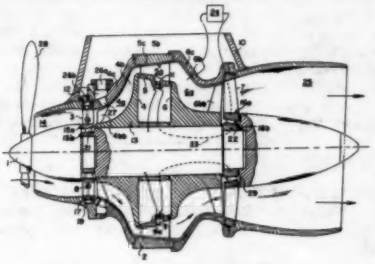
an elongated shaft extending along a longitudinal axis;

a housing mounted about said shaft, said shaft being rotatable relative to said housing about said longitudinal axis;

a conduit, within said housing and fixed to said shaft, having a compression section extending generally radially from said shaft, a combustion section extending generally axially and parallel relative to said shaft and from said compression section at a radial distance from said shaft and an expansion section extending from an end of said combustion section remote from said compressor section;

inlet means, extending through said housing, for receiving relatively inert motive liquid from outside said housing and conveying said motive liquid to said conduit to fill said conduit with said relatively inert motive liquid; and

bubble means, adjacent an inlet end of said compression section, for inducing bubbles of combustible gas into said motive liquid in said compression section;



whereby the combustion gas bubbles are compressed during movement through said compression section, are ignited in said combustion section, and pass through said expansion section with said motive liquid.

4,8[illegible],996

LOW-LOSS CYCLICALLY-OPERATING PRESSURE-RESPONSIVE BYPASS VALVE FOR FIXED DISPLACEMENT PUMP FLOW CONTROL

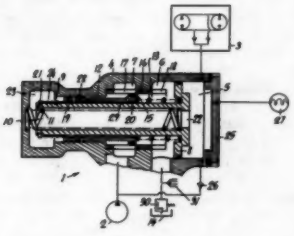
Faust Hagin, Munich, and Stefan Martial, Ulm, both of Fed. Rep. of Germany, assignors to MAN Nutzfahrzeuge GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 27, 1987, Ser. No. 78,518

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1986, 3626187; Apr. 14, 1987, 3712716

Int. Cl.[4] F15B *11/02, 13/02*

U.S. Cl. 60—468 **14 Claims**



1. A system for varying the output flow from a constant rate feed pump with low losses by chopping the output flow into one flow fraction supplied to the load as a power flow and into another flow fraction returned as a pressureless flow characterized in that the load is aperiodically supplied with proportionated amounts of fluid by chopping, the respective amounts of fluid and the chop frequency being inherently controlled in dependence on the instantaneous requirement of the load, said system comprising:

a housing provided with a number of pressure spaces arranged to be acted upon by different flows and with at least one pressureless space,

a piston arranged in a piston space, said piston space being a first of said pressure spaces, said piston including a piston rod secured thereto,

a compression spring arranged in a hole in said piston rod

and adapted to act against the sum of the hydraulic forces acting on the piston,

a spool having opposite end faces, a spring bearing on one end face of the piston and pressure means acting on the other end face of the spool, so as the constitute a system dependent on the relationship between the spring force and the hydraulic force, said piston space being connected on the one hand to a load and on the other hand to the constant rate pump via a check valve, a second pressure space being connected to an oil tank and a third pressure space being connected with the constant rate pump,

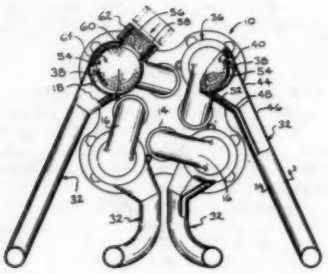
and means for alternately connecting the second and third pressure spaces together and for separating them on attainment of an upper or lower permissible pressure limit.

4,897,997

SHELL AND TUBE HEAT PIPE CONDENSER

Roelf J. Meijer, and Robert P. Verhey, both of Ann Arbor, Mich., assignors to Stirling Thermal Motors, Inc., Ann Arbor, Mich.

Filed Aug. 19, 1988, Ser. No. 233,732
Int. Cl.[4] F02G 1/04; F28D 15/02
U.S. Cl. 60—517 **22 Claims**



1. A heat pipe working fluid conduit assembly for transferring vaporized working fluid from a heat pipe evaporator to a heat exchanger of a Stirling engine and for returning liquid working fluid from said heat exchanger to said evaporator comprising:

a conduit communicating with said evaporator and said heat exchanger for transferring said vaporized working fluid, said conduit having a flared shell joining said heat exchanger whereby the cross-sectional area of said conduit increases as said vaporized working fluid approaches said heat exchanger, and

a duct disposed inside said conduit extending into said flared shell and having an inlet within said flared shell for receiving said liquid working fluid from said heat exchanger and returning said liquid to said evaporator.

4,897,998

TURBO COMPOUND ENGINE

Shigeo Sekiyama; Shigeru Nihongi, and Sadatoshi Mogami, all of Kawasaki, Japan, assignors to Isuzu Motors Limited, Tokyo, Japan

Filed Oct. 28, 1988, Ser. No. 264,298
Claims priority, application Japan, Oct. 28, 1987, 62-270327; Oct. 28, 1987, 62-270328
Int. Cl.[4] F02G 5/00
U.S. Cl. 60—614 **22 Claims**

1. A turbo compound engine adapted for use with a vehicle and controlled by an operator, comprising:

an engine having an output shaft, an intake air passage and an exhaust gas passage;

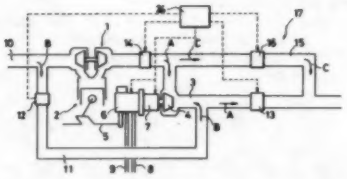
a governor and a control rack therefor;

a rotor disposed in the exhaust gas passage and rotatable in first and second directions, the first direction being the direction the engine output shaft rotates and the second direction being the direction opposite said first direction, the rotor being rotatable in a manner such that the rotor applies energy to the engine when it is rotated in said first direction by the exhaust gas from the engine whereas the rotor applies a brake force against the engine when it is rotated in said second direction by the intake air;

an intermediate member for connecting the rotor with the engine output shaft;

a first bypass line coupled with the intake air passage and joined with the exhaust gas passage downstream of the rotor for allowing the intake air to bypass the engine and reach the rotor;

a second bypass line coupled with the exhaust gas passage upstream of the rotor for allowing exhaust gas from the



engine to bypass the rotor when the rotor changes its direction of rotation from the second to the first direction of rotation and for allowing the intake air introduced through the first bypass line to flow therethrough when the rotor is rotating in the second direction of rotation thereof;

a selector switch operated by the vehicle operator for selecting between the first and second directions of rotations of the rotor;

reversing means for changing the rotation direction of the rotor when the operator operates the selector switch; and

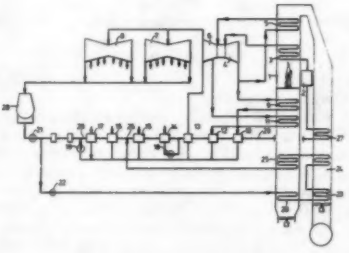
control means for closing the second bypass line for a predetermined period of time when the selector switch is operated to select the first direction of rotation of the rotor and the amount of movement of the control rack of the governor has exceeded a predetermined amount.

4,897,999

STEAM POWER PLANT

John W. Varney, P.O. Box 676, Cornwall, P. E. I., Canada C0A 1H0

Filed Feb. 3, 1989, Ser. No. 305,612
Int. Cl.[4] F01K 7/34
U.S. Cl. 60—678 **5 Claims**



1. In a multi-stage steam power plant, a combustion chamber, a steam generator associated with said combustion chamber, a plurality of steam turbine stages including a first high

pressure turbine and a last low pressure turbine, means to apply the steam from said steam generator to said steam turbine stages, steam bleeds from at least some of said stages and a condenser for receiving the steam output from said last low pressure turbine and having a water condensate output, a duct for providing combustion air to said combustion chamber and a flue for extracting combustion gases from said combustion chamber, a first steam to air heat exchanger in said duct for transferring a portion of the heat from the steam from at least one of said steam bleeds to the combustion air in said duct, a first water to gas heat exchanger in said duct upstream of said first steam to air heat exchanger for transferring a portion of the heat from said condensate output to the combustion air in said duct, a second water to gas heat exchanger in said flue for transferring a portion of the heat from said combustion gases to the condensate output from said first water to gas heat exchanger and a third water to gas heat exchanger in said duct downstream of said first water to gas heat exchanger for transferring a portion of the heat from the condensate output from said second water to gas heat exchanger to the combustion air in said duct.

4,898,000

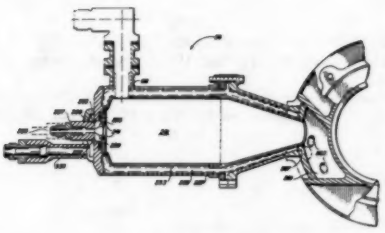
EMERGENCY POWER UNIT

Francis K. Weigand, Torrance; Ronald J. Ness, Corona, and Michael S. Koerner, Harbor City, all of Calif., assignors to Allied-Signal Inc., Morris Townsh., N.J.

Division of Ser. No. 851,198, Apr. 14, 1986, Pat. No. 4,777,793. This application Aug. 9, 1988, Ser. No. 230,214

Int. Cl.[4] F02C *3/14, 7/22*

U.S. Cl. 60—740 **5 Claims**



1. A combustor for an emergency power unit for aircraft, comprising:

a thermal liner defining a combustion chamber having openings at opposite ends thereof;

a pressure shell enclosing said thermal liner;

an insulator disposed between said thermal liner and said pressure shell, said insulator allowing said thermal liner to obtain a temperature approximating the combustion temperature, while inhibiting heat transfer to said pressure shell whereby said shell operates at a greatly reduced temperature;

means for initiating the combustion process within said combustion chamber; and

an injection head secured to said thermal liner in an arrangement sealing one of said openings of said combustion chamber, said injection head configured and arranged to deliver oxidant and fuel to said combustion chamber,

means for receiving pressurized air attached to said injection head;

means for receiving aviation fuel attached to said injection head;

first air plenum disposed radially around said means for receiving aviation fuel and in open communication with said means for receiving pressurized air such that said first air plenum distributes said pressurized air radially around said means for receiving aviation fuel;

a second air plenum disposed radially around said means for receiving aviation fuel in series with said first air plenum;

a plurality of air flow passages between said first air plenum and said second air plenum;

a second plurality of air flow passages extending through said injection head between said second air plenum and said combustion chamber; and

an aviation fuel passageway extending from said means for receiving aviation fuel to said combustion chamber.

4,898,001

GAS TURBINE COMBUSTOR

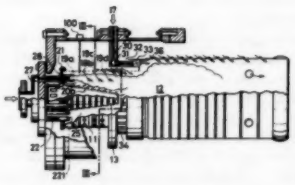
Michio Kuroda; Isao Sato; Yoji Ishibashi; Yoshihiro Uchiyama; Takashi Ohmori; Shigeyuki Akatsu, all of Hitachi; Fumio Kato, Toukai; Yorihide Segawa, and Nobuyuki Iizuka, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 752,680, Jul. 8, 1985, abandoned. This application Jan. 11, 1988, Ser. No. 144,646

Claims priority, application Japan, Oct. 7, 1984, 59-143852; Oct. 7, 1984, 59-143851

Int. Cl.[4] F23R *3/34*

U.S. Cl. 60—733 **25 Claims**



1. A gas turbine combustor comprising:

a head combustion chamber disposed along a longitudinal axis for effecting ignition and maintaining flame;

a rear combustion chamber communicating with a downstream side of said head combustion chamber for admitting and combusting premixed fuel and air therein;

a tubular hollow member at an upstream side of said head combustion chamber along the longitudinal axis to define an annular combustion space;

means for producing diffusion combustion around said tubular member during operation of said combustor and vortex mixing between fuel and air, said means consisting of air inlet means at an upstream side of said annular combustion space for introducing air into said annular combustion space and a plurality of first nozzles projecting into said annular combustion space a distance sufficient, on one hand, to inject fuel into said annular combustion space to produce the diffusion combustion and, on the other hand, to produce the vortex mixing upstream of a fuel injection part of one or more of said nozzles;

a plurality of premixing spaces for admitting fuel and air, said premixing spaces being disposed around the periphery of and at the upstream side of said rear combustion chamber so as to communicate with said rear combustion chamber; and

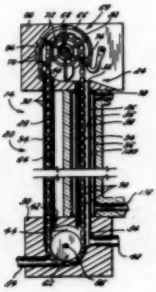
a plurality of second nozzles for injecting fuel into said premixing spaces.

4,898,002

ICE MACHINE

Richard S. Taylor, Joplin, Mo., assignor to The Manitowoc Company, Inc., Manitowoc, Wis.

Continuation-in-part of Ser. No. 150,617, Feb. 1, 1988, Pat. No. 4,845,955. This application Jun. 10, 1988, Ser. No. 205,232
The portion of the term of this patent subsequent to Jul. 11, 2006, has been disclaimed.
Int. Cl.[4] F25C 5/04
U.S. Cl. 62—71 21 Claims



1. In an ice machine including a refrigeration system operable to supply cold refrigerant to a selected location, the improvement comprising:

an upright, elongated, tubular body presenting an exterior surface and an upper end;

means for filling said body with water from a source thereof to a selected level;

an ice harvesting member comprising an endless loop of flexible material and presenting an elongated harvesting portion located within said tubular body and extending substantially along the length thereof;

means for selecting applying the cold refrigerant to said exterior surface of said tubular body in order to freeze the water contained therein to form a column of ice frozen to and thereby attached to said harvesting portion; and

an ice harvesting mechanism including means coupled with said harvesting member for withdrawing said harvesting portion and thereby said column of ice attached thereto through said upper end, said withdrawing means including pulley means rotatably mounted in the vicinity of said upper end coupled with said harvesting member for rotation of said member around the path defined by said loop for withdrawing said harvesting portion from said tubular body, and said pulley means presenting a peripheral surface including a plurality of outwardly extending prongs for breaking said column of ice, said pulley means being rotatable about an axis of rotation, each of said prongs including respective outwardly extending extension pieces coupled with the distal ends thereof, said extension pieces extending generally parallel to said axis of rotation.

4,898,003

AUTOMOBILE AIR CONDITIONER

Toru Ichikawa, Kusatsu; Shuichi Kodama; Nobuo Kagoroku, both of Otsu; Shotaro Ito, Kurita, and Shuichi Honda, Kusatsu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

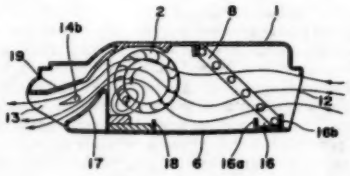
Filed Oct. 31, 1988, Ser. No. 264,884
Claims priority, application Japan, Oct. 30, 1987, 62-276104; Oct. 30, 1987, 62-276105; Dec. 24, 1987, 62-328543
Int. Cl.[4] B60H 1/32
U.S. Cl. 62—244 8 Claims

6. An automobile air conditioner which comprises:

a generally elongated casing having air intake and outlet grilles defined along the longer opposite sides thereof;

a generally elongated evaporator supported in tilted fashion within the casing and so curved as to follow the curvature of the casing;

a pair of cross-flow fans accommodated within the casing in end-to-end fashion so as to extend generally parallel to the direction of elongation of the casing and positioned between the evaporator and the air outlet grille; and



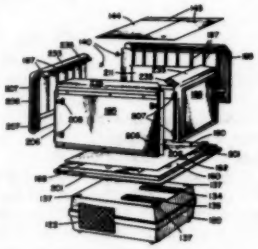
a drive motor for driving each of the cross-flow fans, said casing being shaped and curved so as to have a portion intermediate the length thereof raised to a levl higher than the level of the opposite ends of the casing and, at the same time, the evaporator supported within the casing being so shaped and so curved as to follow the curvature of the casing, said two drive motors being positioned intermediate the length of the casing and drivingly coupled with the cross-flow fans positioned laterally of the drive motors.

4,898,004

IN-STORE REFRIGERATED DISPLAY SYSTEM

James E. Richardson, 28 Ladder Hill Rd. South, Weston, Conn. 06883

Continuation-in-part of Ser. No. 181,921, Apr. 15, 1988, Pat. No. 4,845,957. This application Apr. 12, 1989, Ser. No. 336,747
Int. Cl.[4] A47F 3/04
U.S. Cl. 62—255 20 Claims



17. A refrigerated display system for perishable items, comprising:

(a) a refrigeration unit comprising a cooling means for cooling fluid, a circulation means for causing said cooled fluid to be circulated through an insulated knock-down storage unit, and at least a first pair of openings in said refrigeration unit for permiting cooled fluid to flow out of said refrigeration unit through a first opening of said first pair and or permitting returning fluid to be received in said refrigeration unit via a second opening of said first pair; and

(b) at least a first, a second, and a third pair of insulated side walls, and a first and second plenum, said first plenum corresponding in size to the lengths of said first and second pairs of side walls, and said second plenum corre-

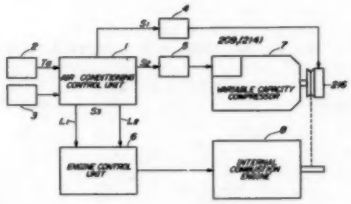
sponding in size to the lengths of said first and third pair of side walls, said third pair of side walls being different in length than said second pair of side walls, said first and second pair of side walls having means for facilitating abutment one to another and together with said first plenum comprising a first said insulated knock-down storage unit, said third pair of side walls having similar said means for facilitating abutment to said second pair of side walls, and said first and third pair of side walls and said second plenum comprising a second said insulated knock-down storage unit, each said insulated knock-down storage unit arranged for being placed together with said refrigeration unit, and for storing said perishable items, and adapted for being knocked down and removed from said refrigeration unit, and replaced with the other of said knock-down insulated storage unit, each said knock-down insulated storage unit further comprising at least one opening through which at least one of said perishable items can be removed, at least a second pair of openings corresponding to said first pair of openings of said refrigeration unit, means for permitting said cooled fluid passing through a first opening of said second pair to circulate about said knock-down unit before passing through a corresponding second opening of said second pair and back to said refrigeration unit.

4,898,005

METHOD OF CONTROLLING IDLING ROTATIONAL SPEED OF INTERNAL COMBUSTION ENGINE FOR VEHICLES EQUIPPED WITH AIR CONDITIONING SYSTEMS

Yoshihiko Sakurai, Saitama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo and Mazda Motor Corporation, Hiroshima, both of, Japan

Filed May 24, 1989, Ser. No. 356,772
Claims priority, application Japan, Jun. 22, 1988, 63-154074
Int. Cl.[4] F02M *3/00*; F25B *1/00*
U.S. Cl. 62—115 7 Claims



1. A method of controlling the idling rotational speed of an internal combustion engine for an automotive vehicle equipped with an air conditioning system having a variable capacity compressor disposed to be driven by said engine and capable of being controlled by an external control signal, the method comprising the steps of:

(1) detecting a value of ambient temperature;

(2) calculating a value of a capacity control signal as said external control signal for controlling the capacity of said compressor;

(3) calculating a value of torque required for starting said compressor based upon the detected value of the ambient temperature and the calculated value of said capacity control signal; and

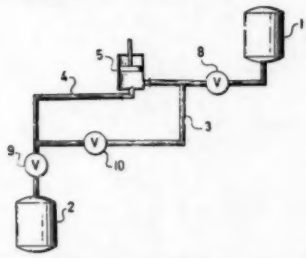
(4) increasing the idling rotational speed of said engine in accordance with the calculated value of the torque required for starting said compressor.

4,898,006

METHOD AND APPARATUS FOR DRAWING OFF LOW BOILING MEDIA FROM PRESSURE SYSTEMS

Zdenek Fencl; Frantisek Janda; Karel Kovarik, all of Prague; Jiri Sára, Revnice, and Antonin Tatous, Prague, all of Czechoslovakia, assignors to Kovoslužba n odní podnik hlavního mesta Prahy, Prague, Czechoslovakia

Filed Oct. 12, 1988, Ser. No. 256,833
Int. Cl.[4] F17C *3/10*
U.S. Cl. 62—48.2 6 Claims



2. An arrangement for drawing off low boiling media from a pressure system into a storage vessel, comprising:

a pressure system;

a storage vessel;

a drawing off conduit, connecting said pressure system to said storage vessel, for drawing off the low boiling media from said storage vessel when the pressure in said pressure system is increased and the pressure in said storage vessel is reduced;

a return conduit connected between said pressure system and said storage vessel; and

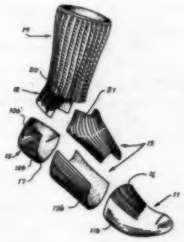
a compressor disposed in said return conduit.

4,898,007

MOISTURE MANAGEMENT SOCK

Ray E. Dahlgren, 56 Corto Rd., Arcadia, Calif. 91006

Filed Nov. 16, 1987, Ser. No. 121,156
Int. Cl.[4] A41B *11/02*; D04B *9/46*
U.S. Cl. 66—185 8 Claims



1. An improved moisture management sock including a foot comprising a toe portion, a heel portion, and an instep portion positioned between said toe and heel portions,

(a) said foot having the following yarn zones:

(i) a first zone comprising said toe portion, and wherein said first zone is knit predominately of hydrophilic yarn,

(ii) a second zone comprising said heel portion, and wherein said second zone is knit predominately of hydrophilic yarn, and

(iii) a third zone comprising said instep portion and being joined edgewise with said first and second zones, and wherein said third zone is knit predominately of hydrophobic yarn, and

(b) whereby moisture absorbed from the wearer's foot by the hydrophilic yarn in said first and second zones (toe and heel portions) is transferred by wicking action into the hydrophobic yarn in said third zone (instep portion) to be evaporated therefrom.

4,898,008

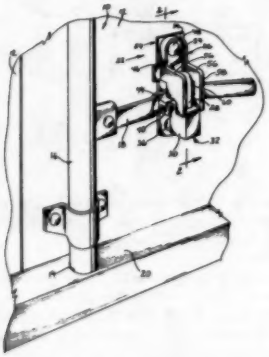
PADLOCK PROTECTOR

David S. Eberly, 5407 Touraine Dr., Tallahassee, Fla. 32808

Filed Jul. 15, 1988, Ser. No. 219,240

Int. Cl.[4] E05B 67/38

U.S. Cl. 70—56 **1 Claim**



1. In combination, a swing-out closure member, a locking mechanism for said closure member, and a padlock protector, said locking mechanism including rod means shiftable between a locked position and an unlocked position, lever means pivotably connected to said rod means for shifting said rod means between its said locked and unlocked positions, a catch secured to said closure member, said catch including channel means for receiving and holding said lever means and having a bored flange, and a padlock having a housing and a retractable protruding shackle, said padlock protector including a block rotatably connected to one of said catch and closure member, said block including head part and a body, and continuous outer peripheral flanges extending outwardly of said body wherein the body is recessed between said flanges, said body having a bore therethrough for aligning with said channel part flange bore to house said padlock shackle, said flanges constituting means for partially surrounding said padlock shackle and housing to prevent unauthorized opening of said padlock and the closure member when in its locked position.

4,898,009

PROTECTIVE COVER FOR A PERSONAL COMPUTER

Robert P. Lakoski, Austin, Tex., and Jody L. Numbers, Tempe, Ariz., assignors to Lama Systems Inc., Austin, Tex.

Filed Mar. 22, 1989, Ser. No. 327,120

Int. Cl.[4] E05B 70/00

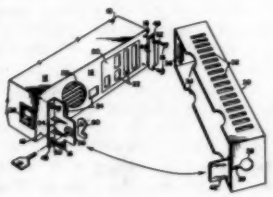
U.S. Cl. 70—58 **10 Claims**

1. An access control device for the back of a personal computer having a base and back panel secured to the base with a plurality of peripheral attachment screws, comprising:

(a) enclosure means for enclosing at least a portion of the back panel, said enclosing means having a height selected to conform to the back panel, a depth sufficient to cover cable port connectors and a width dimensioned to correspond to selected attachment screws, cabling ports, a first element of a first cooperating mounting member, a first element of a second cooperating mounting member, and a plurality of venting slots,

(b) a second element of said first cooperating mounting member, said second element having securing means for attaching said second element to the computer with at least one peripheral screw, said first and second elements of said first cooperating mounting member being engagable to secure said enclosure means to the computer,

(c) a second element of said second cooperating mounting



member having attachment means for securing to the computer with at least one peripheral screw, said first and second elements of said second cooperating mounting member being engagable to secure said enclosure means to the computer,

(d) locking means to lock said enclosure to the computer when said enclosure is secured to cover the back panel.

4,898,010

KEYLESS ENTRY SYSTEM FOR AUTOMOTIVE VEHICLES

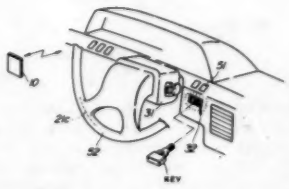
Tohru Futami, and Mikio Takeuchi, both of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 25, 1988, Ser. No. 261,899

Claims priority, application Japan, Oct. 28, 1987, 62-272394; Oct. 28, 1987, 62-272395

Int. Cl.[4] E05B 49/00

U.S. Cl. 70—278 **19 Claims**



1. A keyless entry system for automobiles comprising:

input means for inputting a unique identification code signal;

control means having a code memory, said control means which, when said unique identification code signal matches with a preset identification code signal stored in said memory, outputs a coincidence signal;

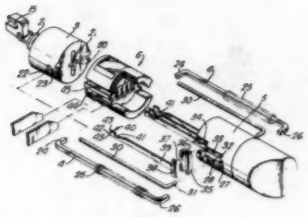
locking key holder means disposed in the vehicular cabin for safely keeping a key, said locking key holder means which, only when receiving said coincidence signal from said control means, allows the key to be operated or to be removed.

4,898,011

LOCK

Walter J. Nugent, Melbourne, Australia, assignor to Walter Locks Pty Ltd., South Yarra, Australia

Filed Mar. 11, 1988, Ser. No. 166,644
Claims priority, application United Kingdom, Mar. 13, 1987, 8705948
Int. Cl.[4] E05B 17/04
U.S. Cl. 70—379 R 23 Claims



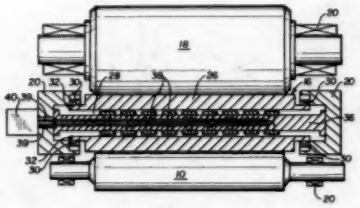
1. A lock, said lock comprising a drive member, means for moving said drive member, a plurality of elongate members movable in response to movement of the drive member, means for selectively positioning the ends of said elongate members relative to one another, and latch means comprising a plurality of latch elements, each associated with one of the elongate members, each defining at least one passage therethrough, and each being movable to a selected position in response to a key being inserted into the lock, the arrangement being such that when the correct key is inserted in the lock the latch elements are moved to such a position that the passage in each latch element is aligned with the free end of a respective elongate member so that the drive member can be moved, causing the elongate members to pass through the passages in the latch elements.

4,898,012

ROLL BITE GAUGE AND PROFILE MEASUREMENT SYSTEM FOR ROLLING MILLS

George B. Jones, and Edward A. Mills, both of Pittsburgh, Pa., assignors to United Engineering, Inc., Pittsburgh, Pa.

Filed Apr. 22, 1988, Ser. No. 184,830
Int. Cl.[4] B21B 37/00
U.S. Cl. 72—11 5 Claims



1. A rolling mill for processing strip material, said mill having at least two rolls, one of which is arranged to serve as either a work roll or a backup roll and subject to and deflected between its ends by the rolling force of the mill developed in rolling the material, said one roll also serving as a means for measuring certain characteristics of the material, such as gauge and profile, and comprising an outer cylindrical sleeve having an outer surface subject to the rolling force,

means for rotatively supporting said sleeve at its opposite ends, and

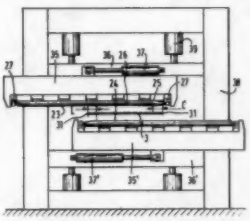
means arranged in the interior of said sleeve for supporting several sensor means axially along the length of said sleeve to measure said material characteristics of different points transversely of the material as the material contacts said outer surface of said sleeve and is subject to the rolling force.

4,898,013

INSTALLATION FOR LEVELLING A METAL STRIP

Francois Mazodier, Saint-Etienne, and René Paulhac, Sorbiers, both of France, assignors to Clecim, Courbevoie, France

Filed Jul. 7, 1988, Ser. No. 215,973
Claims priority, application France, Jul. 8, 1987, 87 09715
Int. Cl.[4] B21D 1/02
U.S. Cl. 72—165 3 Claims



1. An installation for levelling a metal strip (3) with production of elongations by traction-deflection, by advance of the strip (3) along a longitudinal axis (30) in a levelling stand (10) associated with means (11) (12) for tensioning the strip (3) and comprising, within a housing having two uprights (38),

(a) at least two active rolls (23, 24) and at least two deflector rolls (18) rotating around axes which are parallel to one another and perpendicular to a longitudinal axis of advance (30) of the strip, said active rolls (23, 24) being located on different levels on either side of the strip (3) for defining with said deflector rolls (18) an undulating path for the strip (3);

(b) said active rolls (23, 24) each having an asymmetrical profile comprising, at one end, a narrowed section (25) having a diameter which progressively decreases, the two narrowed sections (25) being provided at opposite ends of said asymmetrical active rolls (23, 24) respectively, on either side of the longitudinal axis (30);

(c) each of said asymmetrical active rolls (23, 24) resting on at least two carrying rolls (21) (22);

(d) said active rolls (23, 24) each associated with its carrying rolls (21) (22) respectively forming two levelling units (4) (5);

(e) said levelling units (4) (5) being resepectively mounted each in a frame forming a case (35) (35');

(f) said cases (35) (35') each being slidably mounted parallel to the axes of the rolls, respectively on an upper beam (36) and on a lower beam, (36') said upper and lower beams being mounted to slide vertically on the uprights (38) of said housing;

(g) height-adjusting means (39) (39') respectively associated with said upper beam (36) and lower beam (36') for adjusting the level of the corresponding active rolls (23) (24); and

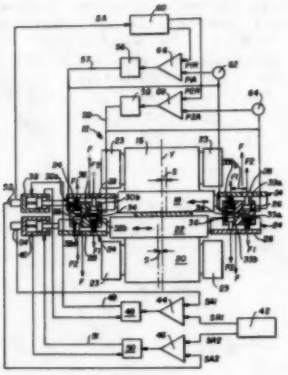
(h) means for controlling the sliding of said levelling units (4) (5) in opposite direction each on the corresponding beam (36) (36') for adjusting the axial position of the narrowed section (25) of each active roll (23) (24) relative to the longitudinal axis (30) of the strip, said means consisting of jacks (37) (37') respectively resting on said upper and lower beams (36) (36') and on the corresponding cases (35) (35').

4,898,014

ROLL SHIFTING SYSTEM FOR ROLLING MILLS

Vladimir B. Ginzburg, Pittsburgh, and F. Ronald Vidil, McKeesport, both of Pa., assignors to United Engineering, Inc., Pittsburgh, Pa.

Filed Dec. 23, 1988, Ser. No. 289,187
Int. Cl.[4] B21B *31/18*
U.S. Cl. 72—247 **8 Claims**



1. A rolling mill having a housing with a window formed therein for receiving at least two rolls together with chock assemblies therefore, which rolls generally define an axial direction, said window including immovable guide blocks for said chock assemblies and means for shifting the rolls in opposite axial directions, the improvement comprising:

separating means received in said blocks and operatively associated with said chock assemblies such that said chock assemblies move relative to said separating means in said axial direction, for imposing through said chock assemblies applied forces on the ends of each roll having the tendency to deflect the rolls in the plane of the major component of the rolling force generated by the rolls, whereby shifting at least one roll changes said applied forces; and

control means for controlling said applied forces in response to said shifting of at least one of the rolls, including

first determining means for determining the amount of roll shifting,

second determining means operatively associated with said first determining means for determining the amount of said change caused by said separating means, and

means responsive to said second determining means for effecting a change in said applied roll deflection forces to maintain the ultimate effect of said forces at a predetermined value.

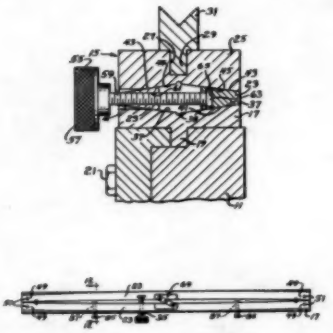
4,898,015

PRESS BRAKE DEFLECTION COMPENSATING DEVICE

David L. Houston, P.O. Box 72757, Roselle, Ill. 60172

Filed Jul. 18, 1988, Ser. No. 220,505
Int. Cl.[4] B21D *5/02*
U.S. Cl. 72—389 **9 Claims**

1. In a press brake having a bed for supporting a tool and a ram for supporting a mating tool, press brake bed and ram deformation compensation apparatus for placement between one of said tools and the press brake bed and ram, the compensation apparatus including an elongate base member, an elongate top member and a pair of elongate wedge members; the base and top members each having adjacent first and second planar surfaces which intersect to form a V-shaped longitudinal recess thereon, the respective V-shaped surfaces being oriented in opposed facing relationship; the wedge members each having upper and lower planar surfaces; the wedge members being oriented between the opposed V-shaped base and top member surfaces whereby the upper and lower planar surfaces of one wedge member slidably engage, respectively, the first surfaces of the V-shaped recesses in the base and top members and the upper and lower planar surfaces of the other wedge member slidably engage, respectively, the second surfaces of the V-shaped recesses in the base and top members; means for securing the wedge members to the base and top members at the opposed longitudinal ends thereof; means for applying lateral forces to the wedge members between the longitudinal ends thereof whereby the longitudinal center regions of the wedge members may be selectively spaced apart a predetermined distance thereby producing an deflection compensating deformation of the top member.

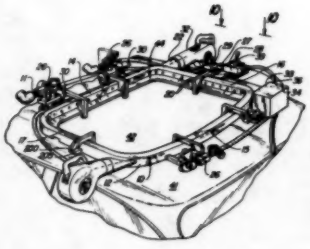


4,898,016

IN-ROOF FLANGING FIXTURE AND PROCESS

Jon D. Moeller, Farmington Hills, and Donald J. Old, Union Lake, both of Mich., assignors to ASC Incorporated, Southgate, Mich.

Filed Sep. 2, 1988, Ser. No. 240,009
Int. Cl.[4] B21D *11/18, 37/16*
U.S. Cl. 72—342 **17 Claims**



1. A flanging fixture for heating and offsetting a peripheral edge of a vehicle surface surrounding an aperture to form a downwardly extending ledge for receipt of a closure panel, comprising:

a frame removably mountable onto a vehicle surface;

means for locating the fixture on a vehicle surface about an aperture;

a means for heating the vehicle surface about the periphery of the aperture;

means for removably securing the frame on a vehicle surface, and;

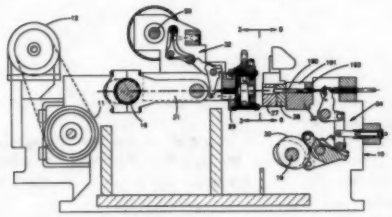
means for forming a ledge about the periphery of the aperture, said means being removably connected to the frame.

4,898,017

QUICK-CHANGE TOOLING FOR PROGRESSIVE FORMERS AND THE LIKE

William H. Hite, and Gene E. Allebach, both of Tiffin, Ohio, assignors to The National Machinery Company, Tiffin, Ohio

Filed Aug. 9, 1988, Ser. No. 230,327
Int. Cl.[4] B21J *13/08, 13/02*
U.S. Cl. 72—405 **18 Claims**



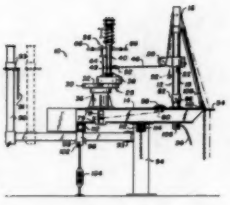
1. A progressive former comprising a die breast on said frame, a powered slide reciprocable on said frame toward and away from said die breast, tooling mounted on said slide and die breast cooperating to define a plurality of work stations for progressively forming workpieces, a transfer for progressively positioning workpieces at said work stations, and tooling support means removably mounted on said slide independent of said die breast for supporting said tooling on said slide, said tooling support means including adjustable means for positioning the tooling therein with respect to the associated tooling on said die breast in three directions perpendicular to each other, said tool support means along with said adjustable means being removable and reinstallable on said slide without disturbing the adjustment of said adjustable means.

4,898,018

STRUT STRAIGHTENING DEVICE

Ray Ventress, 10512 - 135A Street, Surrey, British Columbia V4A 4C8, Canada

Filed Jun. 21, 1988, Ser. No. 209,646
Claims priority, application Canada, Feb. 5, 1988, 565718
Int. Cl.[4] B21D *1/12*
U.S. Cl. 72—457 **18 Claims**



1. An apparatus for straightening an unmounted automotive component comprising:

a pneumatic pull tower mounted at one end of a base and having a first pulley mounted on a movable ram sleeve in said tower and a second pulley movably mounted along said tower;

a driving cylinder housed in said pull tower for applying a force to move said ram sleeve;

component securing means mounted at a second end of said base and adapted to fixedly receive said component;

a pivotable spring compressing column adjacent said component securing means having means for unloading spring tension from a component;

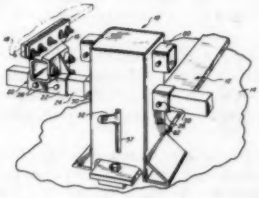
a first chain for connecting at one end to said component and at another end to said base, said chain being led along said first and second pulleys such that when said driving cylinder is activated, said ram sleeve wil apply a force on said chain to straighten said component.

4,898,019

VEHICLE SUPPORT ASSEMBLY

John W. Rich, P.O. Box 810, Elburn, Ill. 60119

Filed Jan. 18, 1989, Ser. No. 299,548
Int. Cl.[4] B21D *1/12*
U.S. Cl. 72—461 **8 Claims**



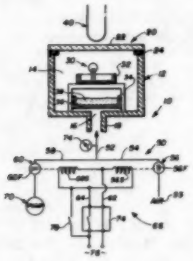
1. In combination with a system for body and frame straightening having at least a pair of tie down tracks which are fixedly secured in spaced apart relationship to a supporting surface, said tie down tracks each being generally T-shaped in cross-section with an upper track member and a lower track member, at least one vehicle support assembly, and a horizontally extending arm having on one end thereof a clamping device for clamping the bottom body flange of a vehicle body to maintain said vehicle body in a stationary position during body straightening operations, the improvement comprising an improved vehicle support assembly comprising a housing supporting said horizontally extending arm, a shaft extending through and supported by said housing, a clamping assembly disposed within said housing comprising a clamp member having a plurality of spaced-apart hooks which are disposed beneath the upper track member of said T-shaped tie down track, a lever pivotally supported at one end thereof by said shaft, a C-shaped cam coupled at one end thereof to said clamp member and coupled at the other end thereof to said one end of said lever, said lever upon being pivotally operated operating said C-shaped cam to raise said clamp member to thereby clamp said spaced-apart hooks beneath said upper track member of said T-shaped tie down track to clampingly secure said vehicle support assembly to said tie down track.

4,898,020

METHOD AND APPARATUS FOR DETECTING AND ELIMINATING ENTRAPPED GAS BUBBLES IN A THICK FILM COATING

Eustathios Vassiliou, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 23, 1987, Ser. No. 137,098
Int. Cl.[4] B01D 19/00
U.S. Cl. 73—19 28 Claims



1. Apparatus for detecting the presence of entrapped gas in a coating of a thick film composition disposed on a member comprising:

a vessel having a chamber sized to receive a member having a thick film composition thereon, the chamber having a fluid therein having an initial ambient pressure,

observation means for viewing the member within the chamber;

means for varying the pressure of the fluid in the chamber a predetermined number of cycles between the initial pressure and a second pressure less than the initial pressure to cause any entrapped gas in the thick film composition to pulsate in a manner observable through the observation means,

wherein each cycle includes a first predetermined time period during which the pressure of the fluid in the chamber is at the initial pressure followed by a second predetermined of time during which the pressure of the fluid in the chamber is at the second pressure,

wherein, the first time period lies in the range from 0.1 to two seconds and wherein the second time period is in the range from 0.5 to ten (10) seconds, and

wherein the initial pressure of the fluid in the chamber is atmospheric pressure and wherein the second pressure is less than forty (40) torr.

4,898,021

QUANTITATIVE AIR INLEAKAGE DETECTION SYSTEM AND METHOD FOR TURBINE-CONDENSER SYSTEMS

Karen L. Weaver, and Michael Twerdochlib, both of Oviedo, Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 30, 1988, Ser. No. 277,827
Int. Cl.[4] G01M 3/04
U.S. Cl. 73—40.7 1 Claim

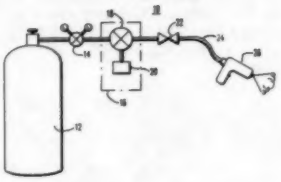
1. A method for determining size of air inleakage holes into a steam turbine system using a tracer gas detection system of the type including a source of tracer gas, at a regulated pressure, control means for discharging a preselected volume of tracer gas to a gas spray nozzle, pump means coupled to the turbine system for establishing an internal pressure less than ambient pressure and a gas detector for providing quantitative signals indicative of tracer gas in the turbine system, the method comprising the steps of:

delivering a predetermined quantity of tracer gas to the spray nozzle;

spraying the predetermined quantity of tracer gas at preslected inleakage sites about the turbine system;

determining the peak amplitude and time duration of detection of tracer gas at a preselected gas monitoring zone from signals from the gas detector;

integrating the gas detector signals to determine the quantity



of tracer gas entering the turbine system through the inleakage site;

comparing the peak amplitude of the gas detector signals to the time duration of the signals to determine the relative distance from the inleakage site to the gas monitoring zone; and

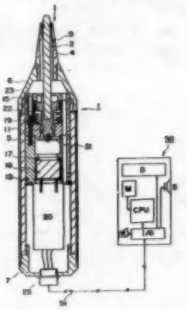
establishing a relative size of the air inleakage holes from the determined quantity of tracer gas obtained from the step of integrating.

4,898,022

STEAM TRAP OPERATION DETECTOR

Hideaki Yumoto; Masao Yonemura; Mamoru Nagase; Yoshito Yamada; Yoshiyasu Fujiwara; Masakatsu Okamoto, and Yasutoshi Hosokawa, all of Kakogawa, Japan, assignors to TLV Co., Ltd., Japan

PCT No. PCT/JP88/00118, § 371 Date Nov. 28, 1988, § 102(e) Date Nov. 28, 1988, PCT Pub. No. WO88/05886, PCT Pub. Date Aug. 11, 1988
PCT Filed Feb. 8, 1988, Ser. No. 261,830
Claims priority, application Japan, Feb. 9, 1987, 62-29164; Sep. 14, 1987, 62-230821; Jan. 12, 1988, 63-2758; Jan. 13, 1988, 63-3335[U]; Jan. 13, 1988, 63-3334[U]; Jan. 13, 1988, 63-3333[U]; Jan. 14, 1988, 63-6649; Jan. 14, 1988, 63-6648
Int. Cl.[4] G01M 3/08
U.S. Cl. 73—46 9 Claims



1. A steam trap operation detector comprising a detecting section (1) and an arithmetic section (50);

said detection section (1) including:

a probe (2) arranged to be brought into contact with an object to be detected with a predetermined pressure given by an elastic member for detecting mechanical vibration

owing to a steam current and a condensed-water current within said object to be detected;

diaphragm means (21) for generating ultrasonic vibration in response to said mechanical vibration detected by said probe (2);

a vibration sensor (16) provided in opposition to said diaphragm means (21) for converting said ultrasonic vibration into an electric signal;

a circuit board (20) containing an amplifying circuit for amplifying an output signal of said vibration sensor (16) so as to transmit the amplified output to the outside;

said arithmetic section (50) including;

a memory (M) for storing data corresponding to a variety of steam traps inclusive of said object to be detected;

a central processing unit (CPU) for performing computation while executing comparison between the output signal transmitted from said detecting section (1) and predetermined data selectively obtained from said data stored in said memory (M); and

output units (D; S) for displaying the result of computation of said central processing unit (CPU) and/or for generating a sound output of an audible frequency.

4,898,023

APPARATUS FOR DETECTING INTERNAL PRESSURE OF A CAN

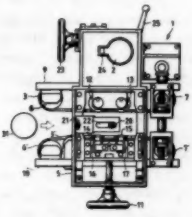
Morio Yamada, and Yoshihiko Kimura, both of Yokohama, Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed May 9, 1988, Ser. No. 192,026

Claims priority, application Japan, May 18, 1987, 62-118884

Int. Cl.[4] G01M *3/36*

U.S. Cl. 73—52 **4 Claims**



1. An apparatus for detecting internal pressure of a cylindrical can, comprising:

a pair of first and second belt conveyors for feeding said cylindrical can without causing the rotation thereof by holding the cylindrical side thereof therebetween, said first and second belt conveyors being arranged in parallel to each other with a first clearance smaller than a diameter of said cylindrical can;

a first sensor means for detecting a reaction force of said cylindrical side, said first sensor means having a first fixed member and a first load cell arranged with a second clearance therebetween slightly smaller than said diameter of said can;

a second sensor means for detecting a reaction force of said cylindrical side, said second sensor means having a second fixed member and a second load cell arranged with a third clearance therebetween slightly smaller than said diameter of said can and different from said second clearance, said first and second sensor means being arranged in that sequence along said first clearance between said first and second belt conveyors and each of said first and second load cells having a can contact with an outer surface of an elliptic dome configuration which has a long diameter in a height direction of the can and a short diameter in a can moving direction;

a pair of support frames, one of said frames supporting one of said pair of first and second belt conveyors, and said first and second fixed members and the other frame supporting the other pair of said first and second belt conveyors, and said first and second load cells;

adjusting means for adjusting a distance between said pair of support frames;

a buckling sensor means for detecting a deflection of a cover of said can at a central point thereof, said buckling sensor means being adjustably positioned between said first and second belt conveyors;

a timing sensor means for operating said buckling sensor when said central point of said can is positioned directly below said buckling sensor by detecting a foremost portion of said can;

a calculation means for converting a difference between a maximum reaction force detecting by said first sensor means and a maximum reaction force detected by said second sensor means into an internal pressure of said can; and

a comparing means for comparing said deflection detected by said buckling sensor with a predetermined allowable value.

4,898,024

PIEZOELECTRIC PRESSURE MEASURING INSTRUMENT

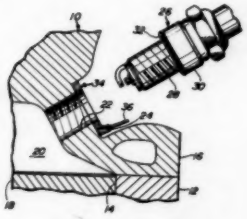
Kiyoshi Takeuchi, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 12, 1988, Ser. No. 192,944

Claims priority, application Japan, May 22, 1987, 62-76050[U]; May 29, 1987, 62-81045[U]; Jun. 2, 1987, 62-85521[U]

Int. Cl.[4] G01L *9/08;* **G01M** *15/00*

U.S. Cl. 73—115 **20 Claims**



1. A pressure measuring instrument for the measurement of combustion chamber pressure in the cylinder of an internal combustion engine, comprising:

a cylinder head formed with a spark plug insert bore having a female thread, said cylinder head including a first substantially flat wall extending radially outward from one axial end of said spark plug insert bore;

a spark plug including a portion having a male thread engaged with said female thread of said spark plug insert bore, and a second radially extending wall opposed to and spaced from said first wall of said cylinder head,

a piezoelectric pressure sensor surrounding said portion of said spark plug and disposed between said first and second walls;

said sensor comprising an annular disk-like electrode with an output terminal, a piezoelectric element in contact with said electrode, a pair of annular pressure acting members having interposed therebetween said electrode and said piezoelectric element, and a lead;

one of said pair of annular pressure acting members having an axially extending wall disposed inward of the inner periphery of the other of said pair of annular pressure acting members; and

a gasket disposed between said first and second radially

extending walls, radially outward of said axially extending wall and on the other of said pair of annular pressure acting members,

said axially extending wall being curved radially outward to form a terminal end portion holding said gasket on said the other of said pair of annular pressure acting members,

one of said pair of annular pressure acting members being in abutting engagement with one of said first and second walls with said terminal end portion being in abutting engagement with the other of said first and second walls.

4,898,025

METHOD FOR DETERMINING THE MEAN EFFECTIVE TORQUE OF AN INTERNAL COMBUSTION ENGINE

Matthias Weyland, Kallstadt, Fed. Rep. of Germany, assignor to Asea Brown Boveri Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

Filed Dec. 16, 1988, Ser. No. 285,703

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1987, 3743066

Int. Cl.[4] G01M *15/00*

U.S. Cl. 73—117.3 8 Claims

1. Method for determining the mean effective torque of an internal combustion engine connected through a connecting shaft to a load device, which comprises determining the torque of the shaft with a torque sensor connected to the shaft, scanning the angular velocity of the crankshaft of the engine at equidistant angular points on the crankshaft being spaced apart in time by a whole number multiple of the torque harmonic period, differentiating the crankshaft angular velocity with respect to time by forming the difference between sequential angular velocities and time measurement of a scanning period, forming a mean acceleration torque from the crankshaft angular acceleration determined by multiplication with the mass moment of inertia of the internal combustion engine, and adding the acceleration torque to the mean shaft torque to provide the mean effective torque.

4,898,026

PROCESS FOR TESTING DRIVING AXLES AND DEVICE FOR PERFORMING THE PROCESS

Joerg P. Damitz, Runkel, Fed. Rep. of Germany, assignor to Glyco Antriebstechnik GmbH, Wiesbaden, Fed. Rep. of Germany

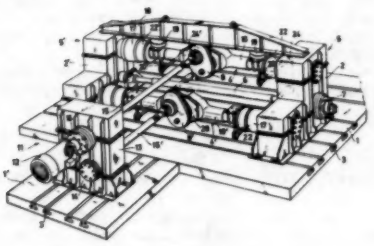
PCT No. PCT/DE87/00586, § 371 Date Sep. 29, 1988, § 102(e) Date Sep. 29, 1988, PCT Pub. No. WO88/04417, PCT Pub. Date Jun. 16, 1988

PCT Filed Dec. 9, 1987, Ser. No. 273,858

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1986, 3642717

Int. Cl.[4] G01M *19/00*

U.S. Cl. 73—118.1 18 Claims



1. A method of testing driving axles for motor vehicles, comprising the steps of:

mounting at least one driving axles in respective gear units at opposite ends in a test stand so that said axle has opposite axle shaft ends at said gear units and an axle housing extending between said units and supported on said stand;

connecting a drive motor to one of said ends through one of said units and a load to the other of said ends through another of said units for driving said axle while loading same; and

applying to said axle on said test stand a plurality of other forces independent of forces applied by said drive motor and load and sufficient to enable testing of total function of the axle under simultaneous drive and carrying conditions, the application of said other forces including application to said shaft ends of dynamic lateral forces corresponding to wheel-disk reaction forces applicable to the axle in use.

4,898,027

SYSTEM FOR MEASURING THE HEIGHT ABOVE GROUND LEVEL OF VEHICLES

Luigi Morra, Asti, Italy, assignor to Industrie Rinalte SpA, Beinasco, Italy

Division of Ser. No. 797,020, Nov. 12, 1985, Pat. No. 4,674,768. This application Jan. 8, 1987, Ser. No. 1,527

Claims priority, application Italy, Nov. 15, 1984, 23587 A/84

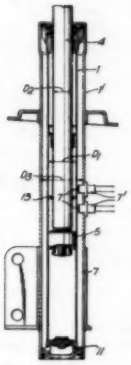
Int. Cl.[4] G01M *19/00*

U.S. Cl. 73—118.1 4 Claims

1. A system for measuring the height above ground level of vehicles comprising,

a Hall-effect position detector means mounted within a housing of a shock absorber including at least one ring-shaped magnet fixed to a piston rod mounted in a working cylinder of the shock absorber and at least one sensor means mounted on an outer face of said working cylinder, said working cylinder being non-magnetic and said sensor

means generating a voltage signal modulated according to a distance between said magnet and said sensor means,



whereby the position of said piston rod relative to said working cylinder is sensed.

4,898,028

PISTON FOR A HIGH-ENTHALPY WIND TUNNEL

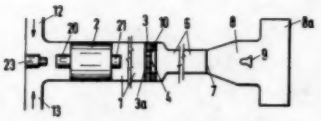
Lothar Brehm, Frankfurt, Fed. Rep. of Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 25, 1989, Ser. No. 301,777

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1988, 3804044

Int. Cl.[4] G01M *9/00*

U.S. Cl. 73—147 **5 Claims**



1. In a wind tunnel assembly having first and second passages, a test chamber and means for producing a pressure surge including a diaphragm at the end of the first passage, a thin sheet at the end of the second passage, the second passage is filled with a test gas, a piston, means mounting the piston for movement under the action of a gas pressure of at least 20 bars in the first passage from an initial position to a target surface so that the diaphragm disposed at the end of the first passage is torn under the compression produced by the approaching piston, and the resulting pressure surge is transmitted by the second passage, that is filled with the test gas, to the thin sheet to tear the sheet and effect the flow of the test gas as a supersonic shock wave into the test chamber, first locking means disposed at a rear portion of the piston and a stationary holder having second locking means cooperative with the first locking means when the piston is in its initial position.

4,898,029

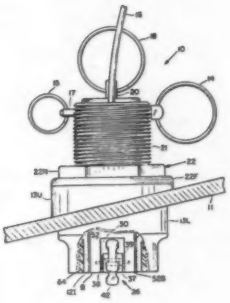
MARINE INSTRUMENT

Stephen G. Boucher, Amherst, N.H., assignor to Airmar Technology Corporation, Milford, N.H.

Continuation of Ser. No. 178,898, Mar. 31, 1988, Pat. No. 4,836,020, which is a continuation of Ser. No. 7,527, Jan. 28, 1987, abandoned. This application Feb. 14, 1989, Ser. No. 310,859

Int. Cl.[4] G01C *21/10*

U.S. Cl. 73—187 **18 Claims**



1. A speed sensor for mounting to a marine vessel comprising:

a. a housing secured to said marine vessel;

b. a removable body disposed in said housing;

c. a paddlewheel cavity formed in said body;

d. a magnetized paddlewheel having a plurality of paddles extending from a central hub and adapted to be rotatably mounted on an axle extending across said cavity transverse the fore and aft direction of travel of the vessel; and wherein the ratio of the cross-section of the paddles in a plane transverse the direction of flow versus the available cross-sectional space within the cavity is in a range between about 0.25 to 0.5;

e. a magnetic sensor located adjacent said paddlewheel.

4,898,030

PROPELLANT REMAINING GAGING SYSTEM

Tso-ping Yeh, Fremont, Calif., assignor to Ford Aerospace Corporation, Newport Beach, Calif.

Filed Apr. 5, 1988, Ser. No. 177,701

Int. Cl.[4] G01F *17/00, 23/28;* B65D *85/00*

U.S. Cl. 73—290 V **17 Claims**

1. Apparatus for gaging the amount of liquid propellant remaining in a tank on board a spacecraft, comprising:

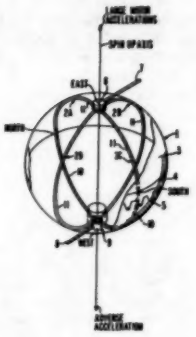
a hollow tank containing a liquid propellant and an ullage having a pressurant gas;

an outlet port, centered in a first half of the tank, for expelling from the tank liquid propellant but not pressurant gas, wherein relatively large operational accelerations of the spacecraft pass through the outlet port;

several elongated channels comprising relatively closed portions and relatively open portions, said channels communicating liquid propellant to the outlet port from regions within the tank, including a second half of the tank joined to the first half, wherein within the first half of the tank, at least one of the channels comprises solely relatively closed portions, and within the second half of the tank, at least one of the channels comprises solely relatively open portions;

at least one ultrasonic transducer mounted on an exterior surface of the tank, said transducer disposed to measure distance to a liquid/gas interface within an interior region of the tank; and:

coupled to each of said at least one transducer, means for determining the amount of liquid propellant remaining



within the tank and the expected remaining lifetime of the spacecraft.

4,898,031

VIBRATIONAL ANGULAR VELOCITY SENSOR

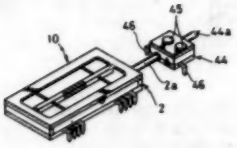
Takahiro Ohkawa; Yoshiyuki Suzuki, and Tatsumi Ohtsuka, all of Shizuoka, Japan, assignors to Yazaki Corporation, Japan

Filed Jul. 22, 1988, Ser. No. 222,751

Claims priority, application Japan, Jul. 24, 1987, 62-112723[U]; Jul. 24, 1987, 62-112724[U]; Jul. 24, 1987, 62-112726[U]; Jul. 24, 1987, 62-112728[U]; Jul. 24, 1987, 62-183741; Jul. 24, 1987, 62-183743

Int. Cl.[4] G01P *15/08*

U.S. Cl. 73—505 **7 Claims**



1. A vibrational angular velocity sensor comprising:

(a) an angular velocity vibration element;

(b) a glass vacuum casing for housing said angular velocity vibration element in a vacuum, an inside surface of said glass vacuum casing being coated with a metallic film to exclude external radiant heat;

(c) at least one support pin, fixed to said glass vacuum casing by glass material within said glass vacuum casing, for supporting said angular velocity vibration element;

(d) a plurality of conductive lead pins extending from the inside to the outside of said glass vacuum casing, the inside ends of said conductive lead pins being connected to signal terminals of said angular velocity vibration element and the outside of said conductive lead pins being arranged with a constant length and connected to an outside printed circuit board for a velocity sensor signal processing circuit; and

(e) a plurality of casing fixing pins also extending from the inside to the outside of said glass vacuum casing, the outside ends of said casing fixing pins being arranged with a constant length and fixed to the outside printed circuit board.

4,898,032

RATE SENSOR

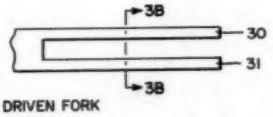
Roger Voles, London, England, assignor to Thorn EMI Electronics Limited, Hayes, England

Filed Jul. 6, 1988, Ser. No. 216,212

Claims priority, application United Kingdom, Jul. 8, 1987, 8716047

Int. Cl.[4] G01P *15/00*

U.S. Cl. 73—505 **12 Claims**



1. An angular rate sensor comprises:

a pair of driven tines and excitation means, responsive to an applied drive signal, for exciting a vibration of the driven tines, a pair of output tines coupled mechanically to the driven tines; and detection means responsive to a vibration of the output tines for generating a detection signal related to angular rate; means for generating a feedback signal related to torsional imbalance of the driven tines, and feedback means, responsive to the feedback signal, for driving the driven tines towards a condition of torsional balance.

4,898,033

ACCELERATION SENSOR

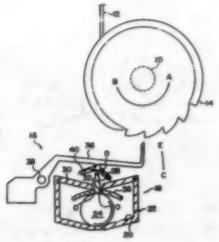
Toshimasa Yamamoto, Aichi, Japan, assignor to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Aichi, Japan

Filed Aug. 26, 1988, Ser. No. 236,737

Claims priority, application Japan, Sep. 24, 1987, 62-145700[U]

Int. Cl.[4] G01P *15/02*

U.S. Cl. 73—514 **20 Claims**



1. An acceleration sensor comprising:

a mass body which is held in a holding member and is movable relative to said holding member when an acceleration of a predetermined magnitude or greater acts on said holding member in a substantially horizontal direction;

a transmission member which is tiltingly disposed upon said mass body in such a manner that an upward movement of said transmission member is prevented and which is tilted when urged by a movement of said mass body; and

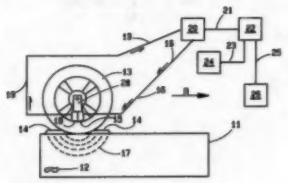
a lever which rests on said transmission member and which is swuhg when the tilting of said transmission member is transmitted thereto.

4,898,034

HIGH TEMPERATURE ULTRASONIC TESTING OF MATERIALS FOR INTERNAL FLAWS

David S. Kupperman, Oak Park, Ill., and Melvin Linzer, Silver Spring, Md., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Aug. 23, 1988, Ser. No. 235,078
Int. Cl.[4] G01N *29/00, 29/04*
U.S. Cl. 73—644 18 Claims



1. Apparatus for nondestructive evaluation of defects in hot materials, such as metals and ceramics, by sonic signals, which comprises in combination:

(a) a buffer in contact with a hot material to be tested for defects, said hot material having a temperature in the range of from about 1700° F. to about 2200° F.;

(b) a liquid couplant consisting essentially of borax, in contact with said buffer and said hot material to be tested;

(c) transmitting means mounted on said buffer and spaced from said hot material to be tested, said transmitting means sending sonic signals through said buffer and said couplant, and into said hot material to be tested; and

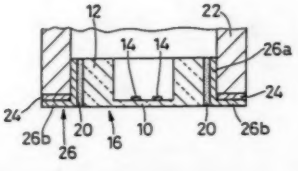
(d) receiving means mounted on said buffer and spaced from said hot material to be tested, said receiving means receiving sonic signals reflected from within said hot material to be tested, through said couplant and said buffer.

4,898,035

PRESSURE SENSOR HAVING SEALING MEMBER FOR SEALING HOUSING INTERIOR WITH RESPECT TO EXTERNAL SPACE

Yasuhito Yajima, and Yasushi Watanabe, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Jan. 9, 1989, Ser. No. 294,412
Claims priority, application Japan, Jan. 16, 1988, 63-7124
Int. Cl.[4] G01L *7/08, 9/06*
U.S. Cl. 73—727 11 Claims



1. A pressure sensor including a cylindrical metallic housing having an open end having an opening, a ceramic pressure sensing element having a ceramic diaphragm and fixedly accommodated within an open end portion of said metallic housing, and strain detecting means associated with said ceramic diaphragm, said ceramic diaphragm being exposed at one of opposite major surfaces thereof to an external space through said opening of the metallic housing and deformable in response to a pressure of a measurement fluid in said external space, an electrical output of said strain detecting means varying with an amount of deformation of said ceramic diaphragm, thereby representing said pressure of the measurement fluid, wherein an improvement comprising:

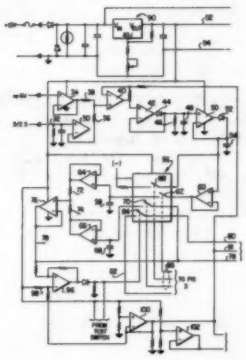
a metallic sealing member which is fluid-tightly bonded to a peripheral portion of said ceramic pessure sensing element with a bonding material, and which is fluid-tightly welded to said open end portion of said cylindrical metallic housing, so that said pressure sensing element is fluid-tightly secured to said metallic housing through said metallic sealing member, such that an interior of said metallic housing is sealed with respect to said external space.

4,898,036

FLOW RESPONSIVE TRANSMITTER AND INDICATOR

Tommy L. Gray, Dallas, Tex., assignor to Span Instruments, Inc., Plano, Tex.

Filed Jan. 21, 1987, Ser. No. 5,830
Int. Cl.[4] G01F *1/28*
U.S. Cl. 73—861.74 14 Claims



1. Apparatus for measurement and display indication of turbulent fluid flow, comprising:

means for generating a present rate of flow signal varying with an on-line measured turbulent flow;

means for generating an updated rate of flow display signal, said means including means for storing the present rate of flow signal, first means for receiving and storing a previously generated updated rate of flow display signal and second means for receiving and storing from the means for storing the present rate of flow signal and further including means connected to said first and second means for receiving for combining the previously generated updated rate of flow display signal with the present rate of flow signal to generate the updated rate of flow display signal;

a rate of flow display indicator; and

means for connecting in sequential order at timed intervals the previously generated updated rate of flow display signal to said first means for receiving, the present rate of flow signal to said second means for receiving, and the updated rate of flow display signal to said rate of flow display indicator.

4,898,037

METHOD AND APPARATUS FOR DETERMINING THE PROPENSITY OF A PAPER OR BOARD TO DUST

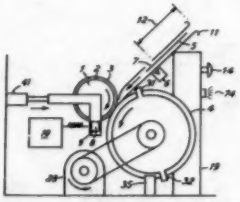
Roger A. Allen, Great Missenden, and Geoffrey Youd, High Wycombe, both of United Kingdom, assignors to The Wiggins Teape Group Limited, Basingstoke, England

Filed Jul. 20, 1988, Ser. No. 221,551

Claims priority, application United Kingdom, Jul. 20, 1987, 87 17118

Int. Cl.[4] G01N 33/34

U.S. Cl. 73—866 16 Claims



1. A method of testing the propensity of a paper or board to dust which comprises passing the paper or board through a nip formed between a reference surface and a feed system, supplementally pressing the reference surface to the surface to be tested at a predetermined pressure and measuring the dust adhering to the reference surface to obtain an indicative reading.

4,898,038

ENGINE STARTING AND CHARGING DEVICE

Yutaka Kitamura, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

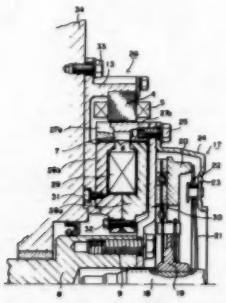
PCT No. PCT/JP88/00128, § 371 Date Oct. 6, 1988, § 102(e) Date Oct. 6, 1988, PCT Pub. No. WO88/06370, PCT Pub. Date Aug. 25, 1988

PCT Filed Feb. 9, 1988, Ser. No. 294,639

Claims priority, application Japan, Feb. 10, 1987, 62-28629

Int. Cl.[4] F02N 17/00

U.S. Cl. 74—6 7 Claims



1. An engine starting and charging device having a starting and charging device body which comprises revolving field poles rotating with an engine crankshaft as a unit, field coils wound around field cores, and an armature coil wound around an armature core, characterized in that a clutch plate is mounted on said crankshaft, said revolving-field poles are fixed on said clutch plate, and a magnetic gap is provided between the outer peripheral section of a pair of field cores which hold said field coil therebetween and the inner peripheral section of said revolving-field poles.

4,898,039

THROTTLE LEVER HOLDING DEVICE

Fumihiko Aiyama, Musashimurayama, and Koji Hirayama, Ome, both of Japan, assignors to Kioritz Corporation, Tokyo, Japan

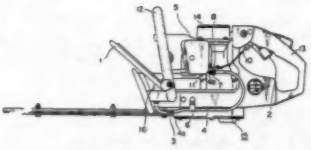
Filed Nov. 13, 1987, Ser. No. 119,927

Claims priority, application Japan, Nov. 14, 1986, 61-174858[U]

The portion of the term of this patent subsequent to Oct. 24, 2006, has been disclaimed.

Int. Cl.[4] F02M 17/34

U.S. Cl. 74—6 2 Claims



1. A throttle lever mechanism comprising:

first and second throttle levers;

a throttle valve opening/closing member for a carburetor;

a pivotable mounted link member having an elongated slot;

a connecting rod connected at one end to the second throttle lever and at another end to the link member through the elongated slot;

cable means having an inner wire cable and an outer tube covering the inner wire cable, a first end of the inner wire cable being connected to the first throttle lever, a second end of the inner wire cable being connected to the throttle valve opening/closing member, a first end of the outer tube being held in a stationary manner, and a second end of the outer tube being connected to said link member; and

an intermediate locking means provided for at least one of the first and second throttle levers for locking the at least one lever in a predetermined operational condition,

wherein when the at least one throttle lever is moved in an operational direction for a first time, the at least one lever is locked in the predetermined operational condition by the intermediate locking means and when the at least one throttle lever is moved in the operational direction a second time, the at least one throttle lever is released from the predetermined operation condition.

4,898,040

POWER TRANSMISSION APPARATUS

Shinichi Tamba, Kobe; Takeshi Miyazaki, Miki, and Akio Miguchi, Kobe, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed Oct. 19, 1988, Ser. No. 259,778

Claims priority, application Japan, Oct. 23, 1987, 62-162660[U]

Int. Cl.[4] F16H 37/06, 55/06

U.S. Cl. 74—15.63 6 Claims

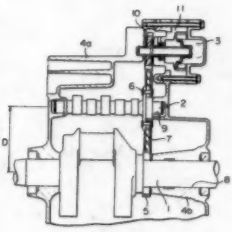
1. A power transmission apparatus comprising:

an aluminum housing;

a first shaft and a second shaft which are rotatably supported by said housing;

an iron gear which is mounted on said first shaft; and

a synthetic resin gear which is mounted on said second shaft and engages with said iron gear, said synthetic resin gear



comprising a synthetic resin and aromatic polyamide fibers which are incorporated into the synthetic resin.

4,898,041

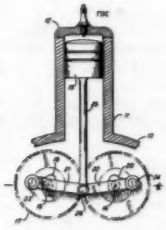
DRIVE LINKAGE FOR RECIPROCATING ENGINE

John J. Islas, R.D. 3, Box 498, Canastota, N.Y. 13032

Filed May 4, 1987, Ser. No. 45,539

Int. Cl.[4] F16H *21/38*

U.S. Cl. 74—44 **9 Claims**



1. In a reciprocating engine of the type in which a piston travels in a cylinder between top dead center and bottom dead center positions, and in which a pair of parallel counter-rotating cranks having crank arms joined by respective connecting rods to said piston and have axes that define a crank plane, such that the rotary motion of the cranks for travel of the piston from the top dead center position to the bottom dead center position is significantly different from 180 degrees, and the rotary motion of the cranks for the travel of the piston from the bottom dead center position to the top dead center position is correspondingly different from 180 degrees in the complementary sense, and wherein the engine further comprises a piston rod that extends from said piston and between the crank axes and is pivotally coupled to said connecting rods such that the pivotal couplings of said piston rod to said connecting rods remains disposed at the side of said crank plane remote from said piston for all travel of said piston between said top dead center and bottom dead center positions; the improvement wherein the piston travel from top dead center to bottom dead center corresponds to crank motion significantly greater than 180 degrees and the piston travel from bottom dead center to top dead center corresponds to crank motion significantly greater that 180 degrees; and the crank arms, the connecting rods, and separation of the cranks are related such that for a given rotation angle of said cranks near top dead center, said piston descends from top dead center substantially at least twice as far as said piston ascends toward top dead center, whereby dwell time at top dead center is significantly reduced.

4,898,042

ROTARY DRIVES

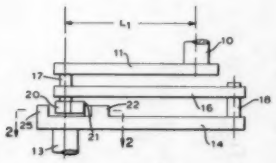
Bryan N. V. Parsons, Stoney Stanton, England, assignor to Jaguar Cars Limited, United Kingdom

Filed Aug. 10, 1988, Ser. No. 230,786

Claims priority, application United Kingdom, Aug. 29, 1987, 8720494

Int. Cl.[4] F16H *21/12*; F01L *7/00*

U.S. Cl. 74—68 **14 Claims**



1. A rotary drive mechanism comprising an input shaft having a first crank, an output shaft mounted parallel to the input shaft but offset radially therefrom by a distance equal to the length of the first crank, said output shaft having a second crank the length of which is greater than the length of said first crank, the first and second cranks being pivotally connected to opposite ends of a link, the link being the same length as the second crank, and interlock means act between the first crank and at least one of the second crank and link, to prevent rotation of the second crank and link independently of the input shaft, when the second crank and link are parallel to one another.

4,898,043

VARIABLE RATIO STEERING MECHANISM

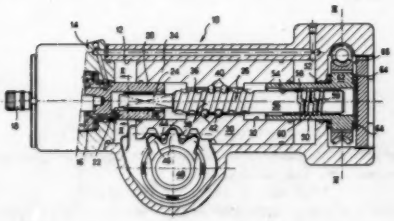
Juan S. Bacardit, Barcelona, Spain, assignor to Bendix Espana, Barcelona, Spain

Filed Oct. 4, 1988, Ser. No. 253,274

Claims priority, application European Pat. Off., Oct. 5, 1987, 87500064.8

Int. Cl.[4] B62D *5/00*; F16H *35/00*

U.S. Cl. 74—388 PS **8 Claims**



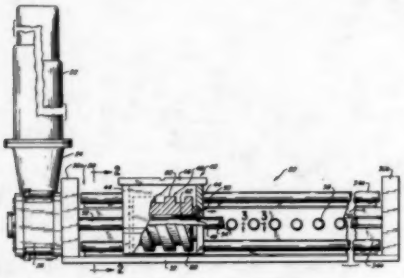
1. A variable ratio steering mechanism comprising a body in which is rotatably mounted an input shaft, a drive shaft having a longitudinal axis and coupled to the input shaft so as to be rotatable therewith, an output member slidably mounted in the body, screw means connecting the drive shaft and the output member so that rotation of the drive shaft produces a corresponding displacement of the output member in the body, characterized in that the drive shaft is axially slidable with respect to the input shaft, the mechanism further comprising means to selectively displace the drive shaft axially with respect to the input shaft, the displacement means comprising screw connection means between a drive member mounted in the body and the drive shaft.

4,898,044

CAM-DRIVEN LINEAR ACTUATOR APPARATUS

Peter E. Galloway, Wilton, Conn., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Oct. 26, 1988, Ser. No. 262,955
Int. Cl.[4] F16H *25/12, 25/22*
U.S. Cl. 74—424.6 **5 Claims**



1. A linear actuator apparatus comprising:

a drive motor assembly;

slide mechanism means driven by said drive motor assembly and operable to convert rotary motion into linear motion, said slide mechanism means comprising an elongated shaft means and a slide means, said slide means rotatably driven by said shaft means and linearly slidable therealong;

a drive cam member securably mounted to said slide means and operable to both rotate and linearly slide therewith;

a plurality of aligned cam follower members each positionally fixed and respectively engageable with said drive cam member; and

load carriage means journalled for sliding movement along a path parallel to said plurality of aligned cam follower members, said load carriage means also journalably supported relative to said drive cam member and said slide means, whereby rotation of said drive motor causes rotation of said drive cam member whereupon said engagement of said positionally fixed cam follower members with said drive cam member causes said drive cam member and said load carriage means to move linearly.

4,898,045

CONTROL DEVICE FOR BOAT ENGINE

Masanao Baba, Takarazuka, Japan, assignor to Nippon Cable System Inc., Takarazuka, Japan

Filed May 9, 1988, Ser. No. 192,032
Claims priority, application Japan, Nov. 20, 1987, 62-294808
Int. Cl.[4] B63H *21/24*
U.S. Cl. 74—471 R **3 Claims**

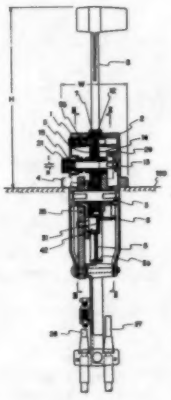
1. A control device for a boat engine comprising:

(a) a clutch arm, an operating disk, a throttle arm, and a single shaft for rotatably supporting said clutch arm, said operating disk and said throttle arm in that order;

(b) an operating lever extending radially and outwardly from a periphery of said operating disk for turning said operating disk;

(c) a gear mechanism installed between said operating disk and said clutch arm to change a first turn stage of said operating disk to a swing movement of said clutch arm; and

(d) a cam groove formed in a side surface of said operating disk facing to said throttle arm, a rack member having a cam-follower inserted in said cam groove, and a set of teeth formed on a boss of said throttle arm and engaging



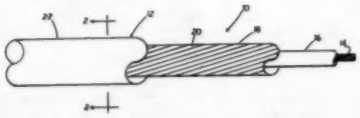
with said rack to change a latter turn stage of said operating disk to a swing movement of said throttle arm.

4,898,046

CONTROL CABLE

James M. Mancewicz, Kent City, and William R. Bosworth, Jr., Hudsonville, both of Mich., assignors to Grand Rapids Controls, Inc., Rockford, Mich.

Filed Dec. 3, 1987, Ser. No. 128,034
Int. Cl.[4] B32B *15/00*; F16C *1/10*
U.S. Cl. 74—502.5 **12 Claims**



1. In a control cable assembly wherein a core wire is slidably mounted in a conduit, an improved conduit comprising:

a tubular liner formed of a plastic resin surrounding the core wire;

a stranded wire reinforcement layer surrounding the liner, the reinforcement layer comprising a plurality of parallel lay wire strands formed of low carbon steel having a carbon content of SAE 1005–1040, the strands being wrapped substantially contiguously in a helical configuration around the liner, the wire strands being 0.008 to 0.020 inches in diameter, the helical configuration having a pitch of 0.5 to 3.0 inches, the carbon content, diameter, and pitch being interrelated in the following manner:

Wire SAE	Pitch for 0.008–0.015 Diameter Wire (inches)	Pitch for >0.015–0.020 Diameter Wire (inches)
1005–1020	0.5–1.5	0.5–2.0
>1020–1030	0.5–2.0	0.5–3.0
>1030–1040	0.5–3.0	0.5–3.0

and

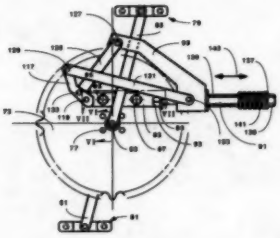
an abrasion resistant jacket surrounding the stranded wire layer.

4,898,047

CRANK AND SPROCKET DRIVE

Douglas A. Cropek, 6400 Oak Acorn Ct., Citrus Heights, Calif. 95621

Filed Sep. 14, 1987, Ser. No. 92,061
Int. Cl.[4] G05G 1/14
U.S. Cl. 74—534.2 6 Claims



1. An apparatus for converting an applied driving force to rotary power comprising:

frame support means for supporting said apparatus;

a sprocket rotatably mounted to said frame support means;

a crank for driving said sprocket; and

resilient connecting means disposed between said crank and said sprocket such that application of force to said crank will deform said resilient connecting means and allow said crank to rotate relative to the rotation of said sprocket in said frame support means without increasing the throw of said crank;

said resilient connecting means comprising:

guide means fixedly attached to said sprocket;

a sliding member configured to engage said guide means and constrained thereby to move along said guide means, and further engaging said crank such that rotation of said crank relative to said sprocket will urge said sliding member along said guide means; and

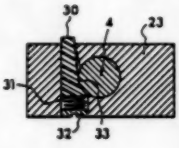
spring means bearing on both said guide means and on said sliding member such that said spring means is deformed as said sliding member is urged along said guide means.

4,898,048

SELF CONTAINED BRAKING SYSTEM FOR BICYCLE PEDALS

Eric A. Sampson, Denver, Colo., assignor to Sampson Sports, Inc., Denver, Colo.

Division of Ser. No. 54,577, May 27, 1987, Pat. No. 4,819,504. This application Jan. 9, 1989, Ser. No. 295,197
Int. Cl.[4] G05G 1/14; B62M 3/08
U.S. Cl. 74—594.4 7 Claims



1. A bicycle pedal system comprising:

a bicycle pedal body and a horizontally disposed axle about which said body can rotate;

an elongated vertically movable member positioned within a cavity in said pedal body,

a top surface on an upper extremity of said member normally projecting above a top surface of said pedal body for receiving pressure applied by a shoe of a cyclist to said top surface of said pedal body,

vertically movable brake means on said member for engaging said axle to inhibit rotation of said pedal body about said axle when said pressure from said shoe is not applied to said top surface of said member, and

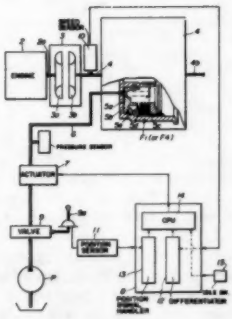
said vertically movable member being responsive when said pressure is applied by said shoe to disengage said brake means from said axle so that said pedal body can rotate freely about said axle and a spring entirely contained within said pedal body and positioned beneath said member for normally forcing said member upwards so that said braking surface is normally pressed upward against a side of said axle to inhibit said rotation of said pedal body about said axle.

4,898,049

ELECTRO-HYDRAULIC CONTROL FOR REDUCING ENGAGEMENT SHOCK IN AN AUTOMATIC TRANSMISSION

Yasuhiro Nilkura, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Jul. 2, 1987, Ser. No. 69,201
Claims priority, application Japan, Jul. 7, 1986, 61-103836[U]
Int. Cl.[4] B60K 41/10
U.S. Cl. 74—866 5 Claims



1. In an automatic transmission having an output member and an input member that is drivingly connected to a torque converter which in turn is drivingly connected to an engine,

a frictional element that may be engaged in response to the flow of a hydraulic fluid to establish a torque delivery path in the automatic transmission, said frictional element being driven through the input member;

means, including a transmission valve which may be selectively placed in any of a plurality of running range positions and in a neutral range position, for supplying hydraulic fluid toward said frictional element when said transmission valve is shifted from the neutral range position to one of the running range positions;

means for sensing the speed of the input member of the automatic transmission and for generating a speed signal indicative of the speed;

means for sensing the idling state of the engine and for generating an idling signal indicative of the idling state of the engine;

a control unit including means receiving the speed signal and the idling signal for generating, only when the engine is in an idling state, a derivative signal indicative of the derivative with respect to time of the speed signal, means for generating a target derivative signal indicative of a target value of the derivative signal, and means for generating an error signal indicative of the difference between the derivative signal and the target derivative signal, and means

responsive to the error signal for generating an output signal; and

means responsive to said output signal for controlling said hydraulic fluid supplying means to reduce said error signal toward zero.

4,898,050

SYSTEM FOR CONTROLLING THE PRESSURE OF OIL FOR A CONTINUOUSLY VARIABLE TRANSMISSION

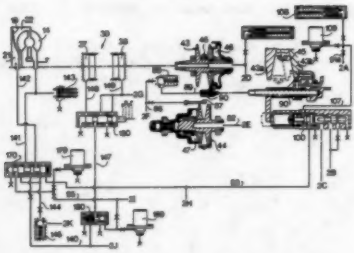
Yasuhito Sakai, Higashimurayama, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 25, 1988, Ser. No. 185,430

Claims priority, application Japan, Apr. 28, 1987, 62-105653

Int. Cl.[4] B60K *41/12*

U.S. Cl. 74—867 9 Claims



1. In a system for controlling pressure of oil for a continuously variable transmission for transmitting power of an engine to wheels of a vehicle, the transmission having pulleys and a belt running thereon, hydraulic cylinders for changing running diameters of the pulleys, a torque converter with a lockup clutch, and a selector device for selecting forward and reverse drives, the system having a hydraulic circuit including a transmission ratio control valve and a line pressure control valve for controlling the hydraulic cylinders, and a lockup control valve for controlling said torque converter with said lockup clutch, the improvement in the system wherein:

each of said control valves has a shiftable spool;

a high pressure oil pump located adjacent the transmission for producing high pressure oil;

a low pressure oil pump located adjacent the torque converter for producing low pressure oil;

both of the oil pumps being operatively connected to the engine so as to be driven by the engine;

a first hydraulic circuit for supplying the high pressure oil to the hydraulic cylinders through the line pressure control valve and the transmission ratio control valve;

a second hydraulic circuit for supplying the low pressure oil to the lockup clutch through the lockup control valve;

a reducing valve supplied with the low pressure oil for producing constant control pressure oil;

a constant pressure circuit for supplying the constant control pressure oil to the transmission ratio control valve, said line pressure control valve and said lockup control valve, for shifting said spools of the respective control valves; and

solenoid operated valves communicated with the constant pressure circuit for producing control pressures for controlling the shifting of said spools of said respective control valves so as to control the supplying of the high pressure oil and the low pressure oil to said hydraulic cylinders and said lockup clutch, respectively.

4,898,051

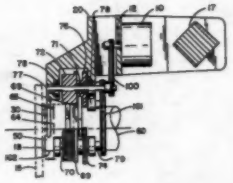
CONNECTOR MATE/DEMATE TOOL

David A. Easter, Westerville; William R. Dick, Columbus; Donald J. Hackman, Columbus, and Kathryn E. Alexander, Columbus, all of Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Filed Dec. 23, 1988, Ser. No. 289,055

Int. Cl.[4] B25B *17/00*

U.S. Cl. 81—57.2 33 Claims



1. A connector mate/demate tool for mating and demating a first section and a second section of a connector comprising:

a. a support frame;

b. a rotational drive means attached to said frame;

c. a means, attached to said frame, for aligning said frame with said second connector section; and

d. a rotary engagement means, attached to said frame and rotatably contacting said first connector section, for axially aligning said first connector section with said second connector section and driven by said rotational drive means for securing and unsecuring said first and second sections of said connector.

4,898,052

AUTOMATICALLY CONTROLLED SOCKET WRENCH

Byung K. Kang, 1516-5 Jung 2-Dong, Pusan Eunghang Apt. #101, Haeundae-Ku, Pusan, Rep. of Korea

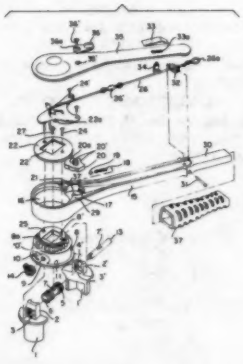
Filed Jun. 28, 1988, Ser. No. 212,692

Claims priority, application Rep. of Korea, Jan. 8, 1988, 12988[U]

The portion of the term of this patent subsequent to Mar. 21, 2006, has been disclaimed.

Int. Cl.[4] B25B *13/00*

U.S. Cl. 81—57.43 6 Claims



1. An automatically controlled socket wrench which comprising:

a body member containing a handle,

a rotating, hollow gear member disposed within said body member, said rotating, hollow gear member containing a spring plate engaging aperture disposed thereon,

a pair of opposing jaw members slidably mounted within said rotating hollow gear member, said pair of opposing jaw members containing a supporter having a screwing aperture, respectively,

a double worm gear member with gears for engaging with said screwing apertures, said double worm gear member having a tubular shaft for receiving an axial pin,

a stopper member disposed in said body member, said stopper member being adapted to operatively engage said rotating gear member for restricting its rotation with said body member by operating a lever, and

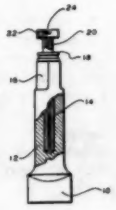
a controlling wire rope connected to said double worm gear member at one end thereof and to switching means at the other end thereof through rollers, said rollers being disposed above the double worm gear member and disposed in said handle, whereby, upon the operation of the means for switching, the jaws are caused to open against the bias of the plate spring, and after the jaws are positioned around an object and after the operation of the lever and the suspending of the stopper member, the jaws are automatically and strongly closed by the spring plate around said object.

4,898,053

SOCKET WRENCH EXTENSION WITH EXTENSIBLE MAGNET

Anthony Russo, 18 Briar Hill Rd., Cedar Grove, N.J. 07009

Filed Oct. 1, 1987, Ser. No. 103,452
Int. Cl.[4] B25B *23/00*; B25G *3/02*
U.S. Cl. 81—125 **5 Claims**



1. A socket wrench extension for use with one of a plurality of removable sockets having different depths, comprising:

a threaded stem having a magnetic head; and

a shank having a driving and driven end, and a threaded axial bore extending into said driving end but falling short of said driven end, said driven end having a drive receiving portion, said shank having at said driving end a polygonal portion with a polygonal cross-section for engagement with an opening in a removable socket, said threaded stem being threaded partially into said bore to extend said magnetic head beyond said driving end, so that said magnetic head can be adjustably extended from said driving end to bring said magnetic head into a position consistent with the different depths of said removable sockets.

4,898,054

TOOL FOR CHIP REMOVING MACHINING

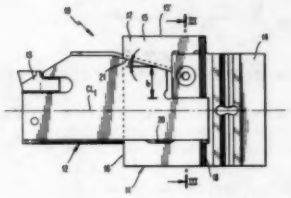
Olof L. Byström, Sandviken, and Sven-Erik V. Johansson, Gävle, both of Sweden, assignors to Sandvik AB, Sandviken, Sweden

Continuation of Ser. No. 78,808, Jul. 28, 1987, abandoned. This application Sep. 27, 1988, Ser. No. 251,014
Claims priority, application Sweden, Aug. 6, 1986, 8603325
Int. Cl.[4] B23B *29/09*
U.S. Cl. 82—160 **20 Claims**

1. In a tool for chip removal machining comprising a holder and a planar blade removably secured in said holder, said blade including a front site for receiving a cutting insert, the improvement wherein:

said holder comprises an expandable securing part and a head attached thereto, said head including a recess extending in a front-to-rear longitudinal direction, said recess comprising an inner wall and blade-engaging edge means including front-to-rear extending upper and lower border edges converging away from said inner wall to define a dove-tail profile as viewed in a cross-section of said recess,

said blade being removably retained in said recess and comprising a one-piece plate extending in a front-to-rear longitudinal direction, said plate containing said insert-receiving site in the form of a pocket and comprising recess-engaging edge means including upper and lower abutment edges forming a dove-tail profile as viewed in a cross-section of said blade, said abutment edges contacting respective ones of said border edges to define therewith contact regions located adjacent front and rear ends of said border edges, said edge means of said blade and holder cooperating to define mutually engageable wedging surface means for applying against said blade:



first wedging forces in response to longitudinal rearward movement of said blade to positively limit said rearward movement of said blade,

second wedging forces in the plane of said blade in a direction perpendicular to said longitudinal direction to force said blade firmly against said lower border edge, and

third wedging forces in a direction perpendicular to the plane of said blade and perpendicular to said longitudinal direction to force said blade firmly against said inner wall of said recess,

said holder including a movable wedge member including a surface defining a portion of one of said border edges, and together with said upper abutment edge applying said second wedging forces, said wedge member being movable relative to said recess in a direction substantially perpendicular to the plane of said plate and substantially perpendicular to said longitudinal direction.

4,898,055

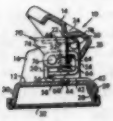
ADJUSTABLE MULTIPLE PAPER PUNCH

Hildaur L. Neilsen, 2 Juniper St., Metuchen, N.J. 08840

Filed Dec. 15, 1988, Ser. No. 285,108
Int. Cl.[4] B26F *1/04*
U.S. Cl. 83—571 **1 Claim**

1. A punching unit for use in a punch having a body and a punch-actuating lever pivoted thereto, said punching unit comprising a body defining a die hole, a punching element in the nature of a die reciprocably positioned in said punching unit body for cooperation with said die hole, and pivoted spacer means carried by said punching unit for movement into and out of overlying relationship with said punching element, whereby said spacer means adds to the length of said punching element when it is pivoted into over-lying relationship there-

with, said unit having a substantially square frame, said spacer element having a substantially planar body with spaced-apart



wings downwardly-extending from opposite sides of said body and a pivot pin connecting said wings within said body.

4,898,056

METHOD AND TOOL FOR PUNCHING PLASTER PLATES

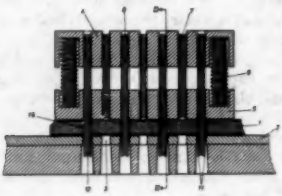
Flan Grobb; Kurt Hvalso, and Benni Madsen, all of Kalundborg, Denmark, assignors to Gyproc A/S, Kalundborg, Denmark

Continuation-in-part of Ser. No. 33,106, Feb. 19, 1987, abandoned. This application Jul. 29, 1988, Ser. No. 228,809

Claims priority, application Denmark, Jul. 1, 1985, 2989/85; PCT Int'l Appl., Jun. 26, 1986, PCT/DK86/00077

Int. Cl.[4] B26F *1/14*

U.S. Cl. 83—689 **14 Claims**



1. A tool for punching plaster boards manufactured from a hardened plaster comprising

punching tools,

a patrix having a main part for holding said punching tools, and a control plate, spring means interposed between said main part and said control plate for ensuring a control pressure of said tools on said plaster board, said control plate engaging closely with the plaster board to ensure a clean cut, and

a matrix for guiding said punching tools, said matrix having a wearing plate with a plurality of openings for receiving said punching tools and base plate having apertures coinciding with said openings of the wearing plate, said openings being adapted for expelling of a material punched out from said plaster board, each said punching tool having a blade positioned at an angle to a surface of the board, wherein during an operation said plaster board is positioned between an outside surface of said control plate and on outside surface of said wearing plate, whereby punching is first performed to form a number of first slits and thereafter form a number of second slits during a further movement to the patrix, said second slits being punched between said first slits.

4,898,057

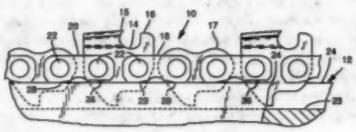
LOW VIBRATION CENTER DRIVE CUTTER CHAIN

Arvin A. Hille, Lake Oswego, Oreg., assignor to Blount, Inc.

Filed Jun. 13, 1989, Ser. No. 365,601

Int. Cl.[4] B27B *33/14*

U.S. Cl. 83—831 **4 Claims**



1. A cutting chain for a chain saw including a cutter bar about which the chain circulates, said bar having a substantially straight portion along which the chain travels and a peripheral groove defined by a pair of opposite side rails, said cutting chain adapted to circulate around said bar in a predetermined direction and comprising:

a center cutter link having a tang adapted to ride within said groove and a cutting tooth formed in the link, the cutter link also having forward and rearward pivot openings;

a pair of oppositely disposed side links each having forward and rearward pivot openings and forward and rearward bar engaging undersides, the width of each of said links between its forward pivot opening and forward bar engaging underside being less than the width between its rearward pivot opening and rearward bar engaging underside; and

pin means extending through the rearward pivot opening of the cutter link and forward pivot openings of said side links for pivotally interconnecting the cutter and side links at said openings and extending through the rearward pivot openings of said side links for interconnecting said links to a following link and through the forward pivot opening of said cutter link for interconnecting said link to a preceding link,

whereby the forward bar engaging undersides of the side link are spaced from adjacent rails of said bar when the axes of the pivot means are substantially in a plane parallel to the surfaces of said rails.

4,898,058

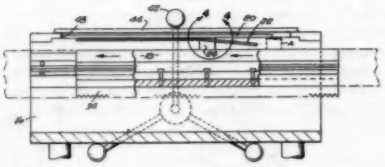
APPARATUS FOR REMOVING PELLICLES

Willis Seifert, Cupertino, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Dec. 24, 1987, Ser. No. 137,881

Int. Cl.[4] B26D *3/28*

U.S. Cl. 83—870 **9 Claims**



9. A method for removing a pellicle of the type having a perimeter frame bonded to a first surface of a photomask with a layer of adhesive comprising the steps of:

(a) placing the photomask in a housing with the first surface of the photomask supported by an upper surface of said housing;

(b) securing the photomask in said housing so as to prevent lateral and longitudinal displacement of said photomask;

(c) positioning a blade rigidly in a movable carriage of said

housing so that a cutting edge of said blade is positioned immediately below said upper surface of said housing so as to intercept the layer of adhesive between the perimeter frame and the first surface of the photomask; and

(d) moving said blade in a controlled manner such that said cutting edge is translated parallel to said upper surface along a path between the photomask and a portion of the perimeter frame of the pellicle;

whereby said pellicle is separated from said photomask.

4,898,059

ELECTRONIC MUSICAL INSTRUMENT WHICH COMPARES AMOUNT OF DATA RECORDED IN INTERNAL MEMORY DEVICE WITH STORAGE CAPACITY OF EXTERNAL MEMORY DEVICE AND SELECTIVELY TRANSFERS DATA THERETO

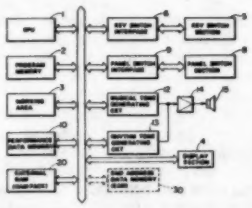
Akira Iizuka, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Feb. 8, 1988, Ser. No. 153,226

Claims priority, application Japan, Feb. 6, 1987, 62-25886; Feb. 6, 1987, 62-25887

Int. Cl.[4] G09B *15/;* G10H *1/00*

U.S. Cl. 84—601 **15 Claims**



12. An automatic performance data recording and reproducing apparatus for an electronic musical instrument comprising:

(a) first memory means for storing performance data;

(b) second memory means for recording performance data transferred from said first memory means; and

(c) transfer means for transferring said performance data stored in said first memory means to said second memory means based on a computed data quantity of said performance data stored in said first memory means and a detected storage capacity of said second memory means in a recording mode, wherein said transferred performance data are reproduced from said second memory means so that musical tones corresponding to the reproduced performance data are generated in a reproducing mode.

4,898,060

MUSICAL ADAPTER FOR NURSING BOTTLE

Ping K. To, 13/F., Flat A, No. 6, Centre Street, Hong Kong, Hong Kong

Filed Dec. 1, 1988, Ser. No. 278,365

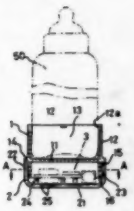
Int. Cl.[4] G10F *1/06*

U.S. Cl. 84—95.2 **4 Claims**

1. An electronic musical adaptor for use with a nursing bottle, a cup, or a liquid container, said adaptor comprising:

a hard injection molded synthetic resin cup-shaped body having an upper portion and a lower portion, a substantially cylindrical wall defining a hollow cavity in said upper portion, means on said cylindrical wall for releasably retaining a liquid container in said hollow cavity, a downwardly open substantially cylindrical skirt on said lower portion of said cup-shaped body, means on said cylindrical skirt for frictionally detachably engaging said cup-shaped body with a bowl-shaped base member;

a bowl-shaped base member having an upwardly extending circumferential wall detachably engaged with said frictional engaging means of said cup-shaped body, said circumferential wall of said bowl-shaped base member jointly defining a space with said cylindrical skirt of said cup-shaped body, and a plurality of through sound holes defined in said bowl-shaped base member for causing sound produced within said space to be transmitted out of said bowl-shaped base member; and



an electronic musical IC device attached to said bowl-shaped base member and received within said space, switch means on said musical IC device for turning on said IC device for producing a sound responsive to tilting of said IC device when said electronic musical adaptor is picked up by a user.

4,898,061

BLOCK-TYPE PERCUSSION INSTRUMENT

Wayne E. Cohen, Emerson, and Donald M. Kralik, Elmwood, both of N.J., assignors to Latin Percussion, Inc., Garfield, N.J.

Continuation of Ser. No. 252,861, Sep. 30, 1988, abandoned. This application Jun. 22, 1989, Ser. No. 370,164

Int. Cl.[4] G10D *13/06*

U.S. Cl. 84—402 **12 Claims**

1. A percussion instrument in the form of an oblong, plastic block comprising:

a generally rectangular block portion having front, top, and bottom faces and an elongated slot in the front face extending substantially the width and depth of the block portion;

a flange extending outwardly on either side and to the rear of said block portion, said flange including at least one mounting means; and

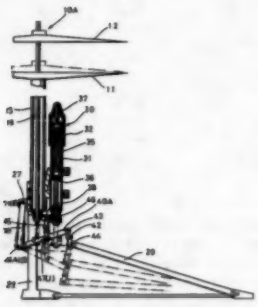
a raised striking ridge extending along the top face adjacent the front face.

4,898,062

HIGH HAT STAND WITH A ROTARY MEMBER

Yoshihiro Hoshino, Nagoya, Japan, assignor to Hoshino Gakki Co., Ltd., Japan

Filed Apr. 4, 1989, Ser. No. 333,563
Claims priority, application Japan, Aug. 24, 1988, 63-209726
Int. Cl.[4] G10D *13/02*
U.S. Cl. 84—422.3 14 Claims



1. A high hat stand for cymbals comprising:
a support for a stationary cymbal and a stationary cymbal carried on the support;
a movable cymbal and an operating rod on which the movable cymbal is supported, the operating rod being movable for moving the movable cymbal in a first, contacting direction to move the movable cymbal into engagement with the stationary cymbal and in a second, out of contact direction for moving the movable cymbal out of engagement with the stationary cymbal;
a pedal operable in one direction for moving the operating rod to move the movable cymbal in the first, contacting direction, and the pedal being movable in the opposite direction for permitting movement of the operating rod in the second, out of contact direction;
a rotary shaft having an axis that extends across the direction of movement of the operating rod in the first, contacting and second, out of contact directions;
a rotary member on the shaft, a first connecting point on the rotary member and spaced a first distance from the axis of the rotary shaft, first means connecting the first connecting point on the rotary member to the operating rod, such that the operating rod is acted upon by a force produced by a lever arm of the length from the axis of the rotary shaft to the first connecting point; a second connecting point on the rotary member and spaced a second distance from the axis of the rotary shaft, second means connecting the second connecting point to the pedal, such that movement of the pedal moves the second connecting point and rotates the rotary member around the shaft;
wherein the first effective radius of rotation between the shaft and the first connecting point is smaller than the second effective radius of rotation between the shaft and the second connecting point.

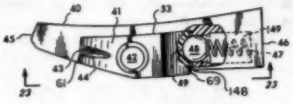
4,898,063

INTEGRATED BICYCLE PEDAL WITH SELF CENTERING AND LATERAL RELEASE CAPABILITIES

Eric A. Sampson, Denver, Colo., assignor to Sampson Sports, Inc., Denver, Colo.

Division of Ser. No. 16,277, Feb. 19, 1987, Pat. No. 4,815,333.
This application Nov. 29, 1988, Ser. No. 277,359
Int. Cl.[4] G05G *1/14*
U.S. Cl. 74—594.6 10 Claims

1. A bicycle pedal system comprising:
a shoe cleat adapted to be affixed to a shoe of a cyclist,
a pedal body adapted to be connected to a shaft on a bicycle crank arm,
an arcuate transverse channel having a first longitudinal radius on a front facing vertical surface of a front extremity of said pedal body, and
an arcuate protrusion on a rear facing vertical surface on a front portion of said cleat with said protrusion having a longitudinal radius equal to said radius of said body, said protrusion of said cleat being adapted to matingly engage in said channel of said pedal body,
a spring loaded detent in a heel portion of said cleat positioned in a horizontal plane below a horizontal plane comprising a top surface of said cleat,
a seating cavity in a rear facing vertical surface of a heel portion of said body and adapted to receive said detent,



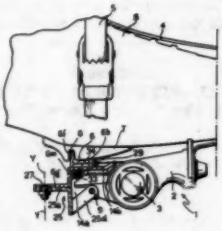
means including said detent and said cavity for matingly engaging said pedal body and said cleat in an interlocked manner with a downward motion of said heel portion of said cleat with respect to said heel portion of said pedal body whereby pedaling forces may be applied to said pedal body by said cleat in an upward, downward, forward and backward direction with respect to the longitudinal axis of said bicycle while minimizing motion of said cleat with respect to said pedal body, and
means including said detent and a front portion of said body and a front portion of said cleat for controllably disengaging said cleat from said pedal body in response to a torsional force on said shoe to which said cleat is affixed with said force being less than said upward pedaling force.

4,898,064

PEDAL WITH A SAFETY DEVICE, FOR RACE-BICYCLES

Antonio Romano, Padua, Italy, assignor to Campagnolo S.p.A., Vicenza, Italy

Filed Nov. 14, 1988, Ser. No. 270,592
Claims priority, application Italy, Nov. 12, 1987, 67965 A/87; Aug. 1, 1988, 67728 A/87; Sep. 22, 1988, 67842 A/88
Int. Cl.[4] G05G *1/14*
U.S. Cl. 74—594.6 10 Claims



1. A pedal for racing bicycles, comprising a pedal body carrying a toe clip with a strap for retaining a cycling shoe at the front, a transverse stop in the form of a projecting plate movably mounted at the rear of said pedal for engagement in a recess formed in a cleat fitted to the sole of the cycling shoe, and adjustable resilient means engaging said transverse stop whereby said transverse top is movable relative to said pedal so as to enable its release from the cleat in use as a result of a force applied by the shoe above a threshold value to overcome said resilient means wherein an intermediate element is articulated

to said pedal body about a main axis substantially parallel to said transverse stop, said transverse stop being connected to said pedal body with the interposition of said intermediate element and being rotatable relative thereto about an auxiliary axis substantially perpendicular to said main axis so as, in use, to allow said transverse stop to be release from the cleat as a result of a pivoting force applied by the shoe of a predetermined magnitude about a substantially vertical axis and subsequent backwards movement of the shoe itself.

4,898,065

PLANETARY REDUCTION GEAR

Seishiro Ogata, and Katsumi Taki, both of Ohbu, Japan, assignors to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

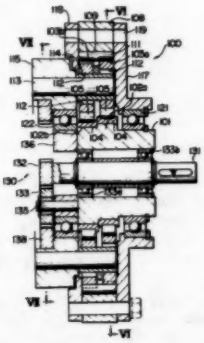
PCT No. PCT/JP88/00210, § 371 Date Oct. 26, 1988, § 102(e) Date Oct. 26, 1988, PCT Pub. No. WO88/06688, PCT Pub. Date Sep. 7, 1988

PCT Filed Feb. 26, 1988, Ser. No. 305,122

Claims priority, application Japan, Feb. 27, 1987, 62-46182; Feb. 27, 1987, 62-46183; Apr. 24, 1987, 62-99873; Apr. 27, 1987, 62-62581; Apr. 27, 1987, 62-62582

Int. Cl.[4] F16H *1/28*

U.S. Cl. 475—179 **12 Claims**



1. A planetary reduction gear having an inscribe type planetary gear mechanism comprising a ring-shaped internally-toothed gear (108; 602), externally-toothed gear means (103*a*, 103*b*; 601*a*, 601*b*) which inscribe in said internally-toothed gear, a plurality of pin-receiving bores (112; 604) provided in said externally-toothed gear means and spaced in the circumferential direction, inner pins (113; 606) loosely received in the pin-receiving bores, a flange (115, 608) supporting said inner pins, and rotatable eccentric means (102*a*, 102*b*; 613*a*, 613*b*) for causing eccentric rotation of said externally-toothed gear means in an orbiting manner,

characterized by comprising a planetary gear mechanism (130; 630) combined with said inscribe type planetary gear mechanism, said planetary gear mechanism (130; 630) including an input shaft (131; 631), an externally-toothed sun gear (132; 635) secured to said input shaft for rotation therewith, a plurality of planet gears (133; 636) arranged around said sun gear in meshing engagement therewith, an internally-toothed sun gear (138; 640) in which said planet gears inscribe, and a rotatable planet carrier (136; 638) rotatably carrying said planet gears and connected to said eccentric means so as to rotate said eccentric means;

wherein one of said internally-toothed gear and said flange serves as an output member while the other serve as a stationary member;

and wherein said internally-toothed sun gear being secured to said output member for rotation therewith;

whereby the rotation of said input shaft is transmitted to said planet carrier through said externally-toothed sun gear and said planet gears so as to cause said planet carrier to rotate in the same direction as the direction of rotation of said input shaft; and

the rotation of said planet carrier is transmitted to said output member through said eccentric means and said externally-toothed gear means so as to cause said output member to rotate in the direction counter to the direction of rotation of said planet carrier.

4,898,066

POLYMERIC FILM ENVELOPED EXPLOSIVE CARTRIDGES AND THEIR MANUFACTURE AND USE

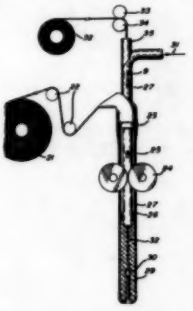
Horst F. Marz, Otterburn Park, Canada, assignor to C-I-L Inc., North York, Canada

Division of Ser. No. 150,979, Feb. 1, 1988, Pat. No. 4,872,408. This application Jul. 25, 1989, Ser. No. 385,441

Claims priority, application Canada, Mar. 25, 1987, 532930

Int. Cl.[4] F42B *3/00*

U.S. Cl. 86—20.1 **1 Claim**



1. A method of manufacturing an improved flexible film-enveloped explosive cartridge comprising the steps of:

(a) positioning an open-ended tube of flexible film so that it describes upper and lower extremities;

(b) positioning centrally within the said tube a cord-like structure having upper and lower extremities;

(c) closing the lower extremity of said tube so as to firmly grip the lower extremity of the said cord-like structure;

(d) placing in the said tube a quantity of explosive; and

(e) closing the upper extremity of said tube so as to firmly grip the said upper extremity of the said cord-like structure so that the said cord-like structure is under longitudinal tension to provide a selected internal cartridge pressure.

4,898,067

COMBING APPARATUS FOR BRAIDING MACHINE

Clint H. Ashton, Warrenton, and Gerald A. Patterson, Manassas, both of Va., assignors to Atlantic Research Corporation, Alexandria, Va.

Filed Jul. 3, 1989, Ser. No. 374,988

Int. Cl.[4] D04C *1/06, 3/00, 3/48*

U.S. Cl. 87—8 **12 Claims**

1. Apparatus for combing fibers extending from a braiding machine to a braid point for the formation of a braided article, comprising:

a flexible line positioned on one side of the fibers and extending generally between the braiding machine and the braid point;

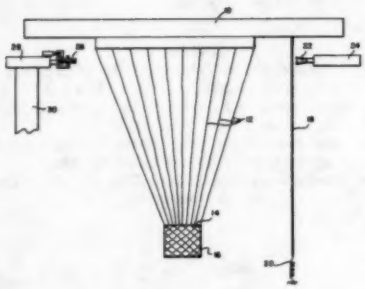
means for pushing the line into the fibers near the braiding machine; and

means for gripping the line when it is pushed into the fibers to pull the line through the fibers and toward the braid point, thereby separating and combing the fibers.

12. A method of combing fibers extending from a braiding

machine to a braid point for the formation of a braided article, comprising the steps of:

positioning on one side of the fibers a flexible line extending generally between the braiding machine and the braid point;



pushing the line into the fibers near the braiding machine; and

gripping the line pushed into the fibers and pulling it through the fibers toward the braid point to separate and comb the fibers.

4,898,068

TORQUE WRENCH

Klaus Neuhaus, Wuppertal, Fed. Rep. of Germany, assignor to Eduard Wille GmbH u. Co., Fed. Rep. of Germany

Filed Mar. 1, 1989, Ser. No. 317,674

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1988, 3808120

Int. Cl.[4] B25B *23/142*

U.S. Cl. 81—483 **20 Claims**

1. A torque wrench, comprising an elongate outer housing; an elongate inner part extending rigidly within said housing from adjacent one end thereof to and beyond the opposite end thereof, that portion of said inner part extending beyond the said opposite end of the housing constituting a handle portion for the wrench, there being clearance between said inner part and said housing permitting transverse movement of one relative to the other; means adjacent to the said one end of the housing pivotally interconnecting said inner part and said housing; means for holding a work-engaging tool at and connected to the said one end of the housing; and spring-loaded, toggle lever mechanism operatively interconnecting said handle portion of the inner part and said outer housing for holding said inner part and said housing against transverse relative movement but arranged to release when a torque exerted on said tool by the wrench is excessive, thereby effecting sudden relative transverse movement between said inner part and said housing to alert the user of the wrench to the excessive torque.

4,898,069

APPARATUS FOR TRANSPORTING CARTRIDGES TO A FIRING WEAPON WITH AN ELEVATION CONTROL SYSTEM

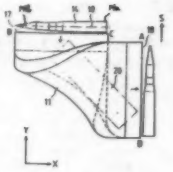
Samuel Schmid, Dietlikon, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zuml/u/ rich, Switzerland

Continuation-in-part of Ser. No. 864,773, May 19, 1986, abandoned. This application Mar. 11, 1988, Ser. No. 167,028

Claims priority, application Switzerland, Jun. 4, 1985, 02355/85

Int. Cl.[4] F41D *10/38*

U.S. Cl. 89—33.01 **13 Claims**



9. An apparatus for feeding cartridges from a stationary container to a firing weapon adjustable in elevation about an elevation axis, said apparatus comprising:

supply means for cartridges to be transported to a region at least in a neighborhood of the elevation axis of the firing weapon;

deflection means cooperating with the supply means for deflecting the cartridges according to a given elevation of the firing weapon and for infeeding the cartridges into the firing weapon;

said deflection means comprising a substantially helical non-flexible cartridge feed channel connected to the firing weapon;

said substantially helical non-flexible cartridge feed channel defining an infeed opening and an outfeed opening;

the cartridges being arranged substantially parallel to the elevation axis at said infeed opening of said substantially helical non-flexible cartridge feed channel;

said infeed opening of said substantially helical non-flexible cartridge feed channel being located at the region at least in the neighborhood of said elevation axis of the firing weapon and during adjustment of the elevation of the firing weapon remaining at the region at least in the neighborhood of the elevation axis;

said firing weapon containing a weapon barrel defining a weapon barrel axis;

the cartridges being arranged substantially parallel to said weapon barrel axis at said outfeed opening of said substantially helical non-flexible cartridge feed channel;

each cartridge of said cartridges possessing a center of gravity;

said cartridges being located within said substantially helical non-flexible cartridge feed channel such that said centers of gravity are positioned substantially along a helix; and

said substantially helical non-flexible cartridge feed channel is wound about an imaginary cylinder having a cylinder axis inclined through an angle of approximately 45° in relation to said elevation axis and with respect to said weapon barrel axis.

4,896,070

ON-BOARD AMMUNITION CONTAINER

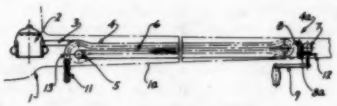
Bernhard Kramer, Markdorf, Fed. Rep. of Germany, assignor to Dornier GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Jan. 25, 1988, Ser. No. 147,809

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1987, 3702119

Int. Cl.[4] F41D *10/36*

U.S. Cl. 89—34 6 Claims



1. An ammunition container for belted rounds to be used in conjunction with automatic guns in an aircraft comprising:

an ammunition belt;

rounds of ammunition having a length and a diameter;

means defining a longitudinally extending principal channel having a width which corresponds at least to the length of a single round and a height equal to at least one diameter of a round;

said channel having two ends, an ammunition feeding end and a belt introducing end; and

a loading device including a loading cable connected to the belt and a winch connected to the cable for pulling the cable, belt and rounds on the belt into the belt introducing end of the channel for reloading the container, the loading cable being unwound from the winch during ammunition feeding from the ammunition feeding end of the channel.

4,898,071

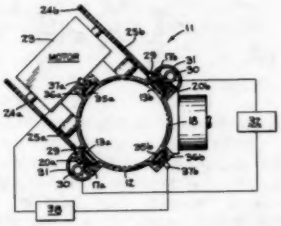
INFLATABLE AMMUNITION GRIPPING DEVICE

Dennis Borgwarth, Anoka, Minn., assignor to FMC Corporation, Chicago, Ill.

Filed Sep. 23, 1988, Ser. No. 248,055

Int. Cl.[4] E41F *9/08*

U.S. Cl. 89—45 7 Claims



1. An ammunition gripping device for handling a variety of soft and irregularly shaped ammunition while applying a considerable amount of force without damage to the ammunition, said gripping device being adapted for use with a pair of sources of pressure, said gripping device comprising:

an elongated transfer tube;

a plurality of inflatable elongated grippers;

means for movably mounting said elongated grippers inside said transfer tube with said elongated grippers extending lengthwise of said transfer tube and with said elongated grippers spaced apart in said transfer tube;

means for connecting said elongated grippers to a first source of pressure to selectively inflate said elongated grippers to grip ammunition inside said transfer tube;

a plurality of inflatable fixed grippers mounted lengthwise inside said transfer tube with said fixed grippers spaced between said elongated grippers and with said fixed grippers being fixed to said transfer tube;

means for connecting said fixed grippers to a second source of pressure to selectively inflate said fixed grippers to grip ammunition inside said transfer tube; and

means for selectively moving said elongated grippers along a length of the said transfer tube to selectively move said ammunition along the length of said transfer tube.

4,898,072

WEAPON AND AMMUNITION CARRIER FOR A GUN

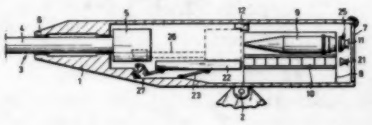
Heiko U. Gropp, Hamburg, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Jul. 15, 1988, Ser. No. 219,972

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1987, 3724867

Int. Cl.[4] F41F *9/06, 9/10*

U.S. Cl. 89—45 6 Claims



1. A weapon and ammunition carrier for a gun having a barrel, comprising:

a housing on which said gun is mounted, said gun being displaceable with respect to said housing from an initial firing position to a recoil position, said housing being pivotally mounted about an elevation axis to elevate said gun;

an ammunition magazine in said housing and positioned adjacent said recoil position of said gun, said magazine including an upper level for accommodating projectiles in such a manner that a projectile disposed at a middle position in said upper level is aligned with said gun barrel, and a lower level for accommodating propelling charges, said magazine having a projectile rammer which ejects said projectiles from said upper level of said magazine and rams said projectiles into said gun barrel, and a propelling charge rammer which ejects said propelling charges from said lower level of said magazine;

catching and holding means for catching and holding said gun barrel in the recoil position;

means responsive to said projectile rammer for releasing said catching and holding means;

recuperator means for axially advancing said gun from the recoil position to the firing position; and

loading tray means for transferring propelling charges from said magazine to said gun, said loading tray means including parallelogram suspension means for pivoting the loading tray means between a receiving position at the height of said lower level of said magazine and a charge loading position for said gun.

4,898,073

VACUUM BRAKE FORCE BOOSTER FOR USE WITH AUTOMOTIVE VEHICLES

Hermann Seip, Bad Vilbel; Wilfried Wagner, Huettenberg-Weidenhausen, and Ralf Jakobi, Liederbach, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt, Fed. Rep. of Germany

Filed Nov. 29, 1988, Ser. No. 277,288

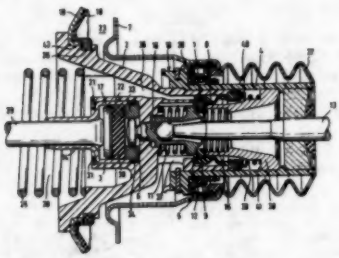
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1987, 3740691

Int. Cl.[4] F15B *9/10*

U.S. Cl. 91—369.2 11 Claims

1. A vacuum brake force booster for use with automotive

vehicles, comprising a vacuum housing sealingly subdivided by an axially movable wall into a vacuum chamber and a working chamber, a mechanically actuable control valve for connecting the working chamber to the vacuum chamber and to the atmosphere, respectively, with the axially movable control valve housing thereof being formed of thermoplastic material and accommodating, within an axial bore, a rubber-elastic reaction disc in abutment with a pressure plate of a



pushrod connected to an actuating piston of a master cylinder provided on a vacuum-side of the vacuum housing, the movable wall being in communication with the control valve housing and with a guiding sleeve adapted to axially guide the pushrods said guiding sleeve including a radial flange and an axial extension which, while accommodating the pressure plate and the reaction disc, is sealingly disposed in the axial bore of the control valve housing.

4,898,074

SERVO-VALVE ARRANGEMENT FOR POWER STEERING

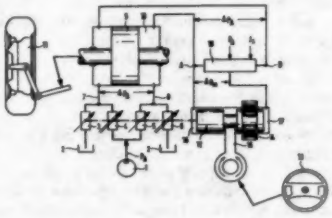
Arno Roehringer, Ditzingen, Fed. Rep. of Germany, assignor to Daimler-Benz AG, Stuttgart, Fed. Rep. of Germany

Filed Jul. 1, 1988, Ser. No. 214,387

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1987, 37218263

Int. Cl.[4] F18P *9/10*; B62D *00/00*

U.S. Cl. 91—371 **16 Claims**



1. A servo-valve arrangement, comprising high pressure and low pressure sides, two parallel throttle sections extending from the high pressure side to the low pressure side with series-arranged controllable throttling means on the high pressure and low pressure sides, two separate motor connections for the connection of inlet and outlet lines of a servo motor, said motor connections branching off from the throttle sections between the throttling means on the high pressure and low pressure side, displaceable control piston means simultaneously controlling the throttling means and operable to produce a controllable pressure difference between the motor connections upon displacement to increase the resistance of the throttling means on the high pressure side and to reduce the resistance of the throttling means on the low pressure side of one throttle section and at the same time to reduce at the other throttle section the resistance of the throttling means on the high pressure side and to increase the resistance of the throttling means on the low pressure side, two piston working spaces coordinated to separate working surfaces of the control piston means which upon actuation with different pressures enable the production of a force opposing an actuating force causing displacement of the piston means, and a third throttle section including a series arrangement of further throttling means with a further controllable throttling means, said series arrangement being, parallel to said servo-motor, one of the piston working spaces being connected to one side and the other piston working space being connected to the other side of one of the further throttling means, said other further controllable throttling means being controllable in dependence on external control magnitudes and in dependence of pressure differences occurring in the third throttle section to thereby change the actuating force for the displacement of the control piston means in dependence on said magnitudes and difference.

4,898,075

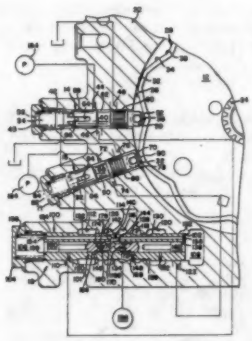
HYDRAULICALLY ACTUATED INDEXING MECHANISM

Joachim Horsch, Lombard, Ill., assignor to J. I. Case Company, Racine, Wis.

Filed Jun. 9, 1988, Ser. No. 204,575

Int. Cl.[4] F01B *1/00*

U.S. Cl. 91—477 **18 Claims**



1. An indexing mechanism comprising: a member adapted to be advanced a predetermined amount and along a predetermined path, said member defining a profile surface including a plurality of spaced tooth segments, each tooth segment having a crown section which is joined to an adjacent crown section by two oppositely directed ramps defining a fillet radius therebetween, each fillet radius being spaced from a crown section a predetermined distance;

a pair of spaced apart drivers which are urged against the profile surface of the member, the spacing between said drivers being such that when one driver is urged against a crown section the other driver acts against a fillet radius, and wherein each driver includes a valve spool reciprocally arranged in a ported valve body and a roller connected to said valve spool to act against said profile surface, with said valve spool and roller being resiliently urged toward said profile surface under the influence of a spring; and

means for supplying a driving force to each driver in an alternative manner such that a driver, after moving off said crown section, coacts with a ramp to impart a driving force to said member, said driving force being sufficient to

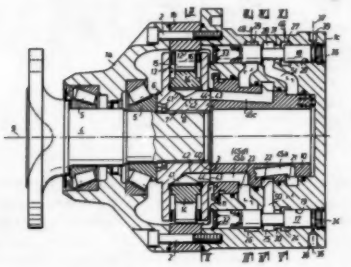
move said member with a constant torque said predetermined amount.

4,898,076

MULTIPLE CYLINDER-CAPACITY PRESSURIZED FLUID (MOTOR OR PUMP) MECHANISM

Louis Bigo, Compiegne, and Bernard Allart, Crepy-en-Valois, both of France, assignors to SOI Societe Anonyme: Poclain Huydraulics, B.P. 12, Verb Erie, France

Filed Feb. 12, 1988, Ser. No. 155,362
Claims priority, application France, Feb. 25, 1987, 87 02509
Int. Cl.[4] F01B *13/06*
U.S. Cl. 91—491 **14 Claims**



1. A pressurized fluid (motor or pump) mechanism, e.g. a hydraulic motor having at least two selectable distinct non-zero cylinder capacities, the mechanisms being constituted by:

at least one first external connector for connection to a source of fluid under pressure, and at least one second external connector for connection to a fluid exhaust;

at least one cam whose profile corresponds to a plurality of successive undulations, said undulations being divided at least into first and second distinct groups of undulations with each undulation comprising a first slope and a second slope;

a cylinder block mounted to rotate relative to said cam about an axis of rotation and which includes a plurality of cylinders disposed substantially radially relative to said axis of rotation;

each cylinder having at least one piston slidably mounted therein and suitable for bearing against the cam and delimiting, within said cylinder, a working chamber which is connected to a communication face of the cylinder block;

a plurality of cylinder ducts each connecting one of the working chambers to said communication face of the cylinder block;

a fluid distribution face constrained to rotate with the cam, said face permanently bearing against the communication face of the cylinder block and having first and second fluid distribution ducts opening out therein and corresponding to said first and second slopes of each of the undulations, said distribution ducts being suitable for being put into communication, during relative rotation of the cylinder block and the cam, with the cylinder ducts of the various cylinders;

a first cylinder-capacity selection slide valve disposed between said first and second external connectors and the first and/or second distribution ducts corresponding to the undulations of the second group of undulations;

a second cylinder-capacity selection slide valve disposed between said first and second external connectors and the first and/or second distribution ducts corresponding to the undulations of the first group of undulations;

each of said first and second cylinder-capacity selection slide valves having two particular positions, which together correspond: (A) with the first cylinder-capacity selection slide valve and the second cylinder-capacity selection slide valve both being in their respective first positions, (a) to the first distribution ducts corresponding to the undulations of both groups of undulations being put into communication with the first external connector, and (b) to the second distribution ducts corresponding to the undulations in both groups of undulations being put into communication with the second external connector; (B) with the first cylinder-capacity selection slide valve being in its second position and the first cylinder-capacity selection slide valve being in its first position, (a) to the first distribution ducts corresponding to the undulations of the first group of undulations being put into communication with the first external connector, (b) to the second distribution ducts corresponding to the undulations of said first group of undulations being put into communication with the second external connector, and (c) to the first distribution ducts corresponding to the undulations of the second group of undulations being permanently isolated from the first external connector and/or to the second distribution ducts corresponding to the undulations of said second group of undulations being permanently isolated from the second external connector; (C) with the first cylinder-capacity selection slide valve in its first position and the second cylinder-capacity selection slide valve being in its second position; (a) to the first distribution ducts corresponding to the undulations of the second group of undulations being put into communication with the first external connector, (b) to the second distribution ducts corresponding to the undulations of the second group of undulations being put into communication with the second external connector, and (c) to the first distribution ducts corresponding to the undulations of the first group of undulations being permanently isolated from the first external connector and/or to the second distribution ducts corresponding to undulations of the first group of undulations being permanently isolated from the second external connector; and (D) with the first cylinder-capacity selection slide valve in its second position and the second cylinder-capacity selection slide valve in its second position, to the first distribution ducts corresponding to undulations of the first group of undulations being permanently isolated from the first external connector and to the second distribution ducts corresponding to the undulations of the second group of undulations being permanently isolated from the second external connector and/or to the second distribution ducts corresponding to the undulations of the first group of undulations being permanently isolated from the second external connector and to the first distribution ducts corresponding to the undulations to the second group of undulations being permanently isolated from the first external connector, and/or to the first distribution ducts corresponding to the undulations of both groups of undulations being permanently isolated from the first external connector, and/or to the second distribution ducts corresponding to the undulations of both groups of undulations being permanently isolated from the second external connector.

4,898,077

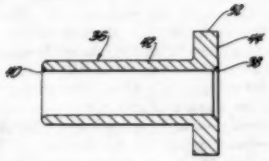
SELF-BLEEDING HYDRAULIC PUMPING APPARATUS

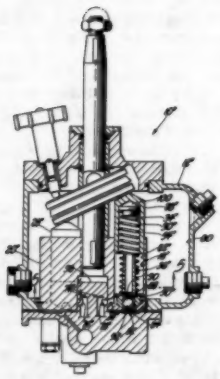
James B. McBeth, N. Vancouver, Canada, assignor to Teleflex Incorporated, Limerick, Pa.

Filed Sep. 6, 1988, Ser. No. 241,079
Int. Cl.[4] F01B *3/00, 13/04*
U.S. Cl. 91—505 **28 Claims**

1. A piston pump assembly (10) of the type for moving a liquid through a conduit system comprising: a housing (12); cylinder means (18) disposed in said housing (12) for receiving a volume of liquid from and expelling the same volume of liquid back into the conduit system, said cylinder means (18) including at least one liquid exhaust port (24); piston means (26) slideably disposed in said cylinder means (18) toward and away from a compressed position adjacent said exhaust port

(24) for urging liquid through said exhaust port (24), said piston means (26) including a surface (34) in continuous contact with the liquid and spaced remotely of said exhaust portion (24) when said piston means (26) is adjacent said compressed position; said assembly (10) characterized by including bleed means (36) disposed in said cylinder means (18) having a first opening (38) in communication with said exhaust port (24) and a second





opening (40) closely spaced from said spaced surface (34) when said piston means (26) is adjacent said compressed position for exclusively expelling the liquid from said cylinder means (18) through both of said first (38) and second (40) openings as said piston means (26) moves toward said compressed position to force gas inclusions trapped in said cylinder means (18) adjacent said spaced surface (34) into said bleed means (36) and out of said cylinder means (18).

4,898,678

HYDRAULIC SYSTEM FOR A WORK VEHICLE

Douglas M. Gage, and Stuart L. Neagle, both of Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.

Division of Ser. No. 96,574, Sep. 11, 1987, Pat. No. 4,809,586. This application Oct. 27, 1988, Ser. No. 263,742

Int. Cl.[4] F15B *11/00*

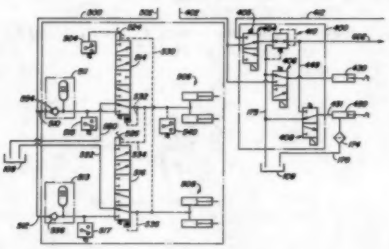
U.S. Cl. 91—524 **8 Claims**

1. A brake system for a work vehicle having a supporting structure and ground engaging means for propelling the vehicle, the brake system comprising:

a source of hydraulic fluid;

a first braking circuit which is fluidically coupled to the source of pressurized hydraulic fluid, the first braking circuit is provided with a first braking hydraulic actuator for braking the vehicle, a first regulating valve for controlling the flow of hydraulic fluid to the first braking actuator, a first outlet for directing hydraulic fluid from the first regulating valve to the first actuator, and a first pedal for shifting the first regulating valve and thereby controlling the flow of hydraulic fluid to the first actuator;

a second braking circuit which is fluidically coupled to the source of pressurized hydraulic fluid, the second braking circuit is provided with a second braking hydraulic actuator for braking the vehicle, a second regulating valve for controlling the flow of hydraulic fluid to the second braking actuator, a second outlet for directing hydraulic fluid from the second regulating valve to the second actuator, and a second pedal for shifting the second regulating valve and thereby controlling the flow of hydraulic fluid to the second actuator;



whereby the first regulating valve is hydraulically balanced between hydraulic fluid in the first outlet and the second outlet, and the second regulating valve is hydraulically balanced between hydraulic fluid in the second outlet and the first outlet, so that when the first regulating valve is shifted by the first pedal, the second regulating valve is hydraulically shifted, and when the second regulating valve is shifted by the second pedal, the first regulating valve is hydraulically shifted.

4,898,079

ELECTRIC OR ELECTRONIC POSITION SENSOR DEVICE

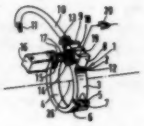
Marc Combette, Bel Air, France, assignor to Celduc S.A., Paris, France

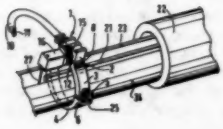
Filed Sep. 14, 1988, Ser. No. 244,179

Claims priority, application France, Sep. 16, 1987, 87 12806

Int. Cl.[4] F01B *25/26, 31/12*

U.S. Cl. 92—5 R **5 Claims**





1. An electrical sensing device for sensing the position of a piston or piston rod relative to a cylinder, the sensing device comprising:

(a) an annular clamping collar formed of a resilient electrically insulating material, having extensions which can be spaced apart to embrace the cylinder and tightened around the whole circumference of the cylinder by means of a tightening screw;

(b) a block integral with said collar and having at least one face thereof parallel to the median plane of the collar;

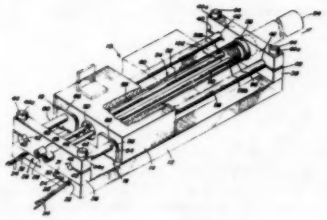
(c) a detector element carried by said block and supported in a cantilevered position with respect to the median plane of the collar so that the detector element has an axis of vision which is offset with respect to the median plane; and
(d) a connection conductor protruding from the block for connecting the detector element to a monitoring system.

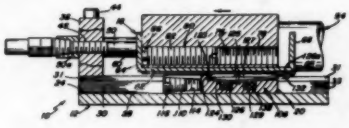
4,898,080

FLUID POWERED LINEAR SLIDE

Walter G. Lieberman, 19172 Biddle Dr., Irvine, Calif. 92715

Continuation-in-part of Ser. No. 84,285, Aug. 11, 1987, Pat. No. 4,829,880. This application Jul. 20, 1988, Ser. No. 221,738
The portion of the term of this patent subsequent to May 16, 2006, has been disclaimed.
Int. Cl.[4] F15B *15/22*
U.S. Cl. 92—14 10 Claims





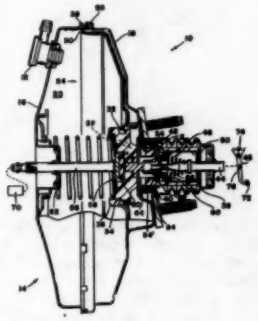
1. A fluid powered linear slide including
a base,
a carriage member mounted to move reciprocably along a linear path between spaced apart terminals
manually adjustable, selectively actuated stop means mounted on the base to be moved to a plurality of different positions between said terminals, said stop means upon being actuated stopping movement of the carriage member,
a fluid power cylinder secured to the carriage member and movable therewith, with the longitudinal axis of the cylinder being parallel to said linear path,
a stationary piston disposed within the cylinder, said cylinder and piston coacting in response to pressurized fluid being introduced into the cylinder to move the carriage first in one direction along said linear path and then along said linear path in an opposite direction by applying said pressurized fluid to opposite sides of the piston,
a pair of stationary tubes extending into the cylinder, each tube having one end adapted to be connected to a source of the pressurized fluid and an opposed end connected to the piston, said ends connected to the pistons and each having port means thereat, with one port means being on one side of the piston and the other port means being on the opposite side of the piston, and
fluid powered means for selectively actuating the stop means.

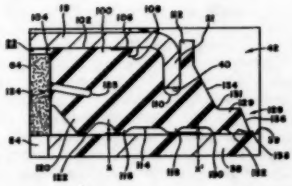
4,898,081

ONE PIECE REAR SEAL FOR SERVOMOTOR

Douglas A. Fecher, Granger, Ind., assignor to Allied-Signal Inc., Morristown, N.J.

Filed Aug. 31, 1988, Ser. No. 238,950
Int. Cl.[4] F16J *15/18*
U.S. Cl. 92—165 R 5 Claims





1. In a brake booster having a housing with an interior divided by a wall into a control chamber and an operational chamber, said wall having a projection that extends through an opening in said wall, said projection moving in said opening as the wall moves in the housing in response to a pressure differential between said control and operational chambers, the improvement in a seal which surrounds said projection to prevent communication of environmental air to said operational chamber along a flow path between the housing and projection that would effect said pressure differential, said seal comprising:
a resilient body having a first end and a second end, said resilient body having a peripheral surface that extends from said first end to said second end, said peripheral surface having a first groove separated from a second groove by a cylindrical surface, a first rib adjacent said first groove and a second rib adjacent said first end and a flange adjacent said second groove, said first rib engaging said housing to form a first static seal with said housing, said second rib engaging said housing to form a second static seal with said housing, said housing having a lip that extends into said second groove to fix the position of said resilient body with respect to said opening, said resilient body having first and second lands located between first and second dynamic seals, said first and second dynamic seals engaging said projection to prevent communication of environmental air into said control chamber, said first and second dynamic seals flexing to allow said projection limited radial movement into engagement with said first and second lands which maintains the projection in substantial axial alignment.

4,898,082

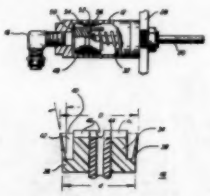
MOLDED PLASTIC AIR CYLINDER

Earl T. Pottorff, 2346 Taylor Rd., Savannah, N.Y. 13146

Filed Sep. 12, 1988, Ser. No. 242,528

Int. Cl.[4] F01B 31/00

U.S. Cl. 92—132 **11 Claims**



1. A plastic pneumatic cylinder device comprising a cylinder housing, a piston within said housing, and a rod on which the piston is mounted projecting axially from the housing; wherein said cylinder housing has a cylindrical bore of a predetermined diameter and a compressed air inlet at one end of the cylinder for admitting air pressure from a compressed air source into the bore to urge the piston and rod in one direction, with means in said cylinder housing to urge the piston and rod in the other direction when said air pressure is relieved; wherein said piston is a one-piece plastic piston molded entirely of a semi-rigid polymer, including a generally cylindrical body and a generally cylindrical sealing skirt surrounding and spaced radially from said body to seal slidably against said bore, said skirt being flared out to have an edge that is of a greater natural diameter than said borer; and wherein said cylinder housing is molded of said semi-rigid polymer including a molded closure of said semi-rigid polymer which fits onto said cylinder housing to contain said piston, said pneumatic cylinder device including means to ensure that said air pressure passes to said skirt to urge the same against said bore when the piston is urged against the inlet end of the bore.

4,898,083

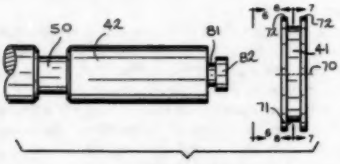
PISTON HEAD AND ROD ASSEMBLY FOR A GEAR PUMP DRY VALVE

Ronald L. Jones, Corinth, Miss., assignor to Dana Corporation, Toledo, Ohio

Continuation of Ser. No. 20,063, Feb. 27, 1987, abandoned. This application Aug. 3, 1988, Ser. No. 229,739

Int. Cl.[4] F16J 1/12, 7/00; F16B 3/00

U.S. Cl. 92—255 **8 Claims**



4. A piston and rod assembly for an apparatus having a housing comprising:

a first bore formed in said housing having an internal dimension;

a second bore formed in said housing having an internal dimension;

a piston head disposed in said first bore, said piston head having an outer dimension which is slightly less than said first bore internal dimension so as to permit a seal therebetween, said piston head including an end surface defining a plane, an internal cavity formed within said piston head and extending through to said end surface so as to define an opening in said end surface, and a lip extending about a first portion of said opening to define a first dimension thereof and not extending about a second portion of said opening to define a second dimension thereof, said second dimension being greater than said first dimension; and

a piston rod disposed in said second bore, said piston rod having an outer dimension which is slightly less than said second bore internal dimension so as to permit a seal therebetween, said piston rod including a neck portion and a tail portion, said neck portion having an outer dimension which is less than said first dimension, said tail portion extending from said neck portion and having an outer dimension which is greater than said first dimension and less than said second dimension, said tail portion being disposed within said cavity and retained therein by said lip such that said piston head and piston rod are movable together along an axis extending perpendicular to said plane while permitting said piston rod to move laterally relative to said piston head, whereby said piston head and said piston rod are movable to one another while retained together to permit said piston head and said piston rod to seal respectively with said first and second bores.

4,898,084

SENSOR-CONTROLLED HYDRAULIC SYSTEM WITH ELECTROVISCOUS FLUIDS

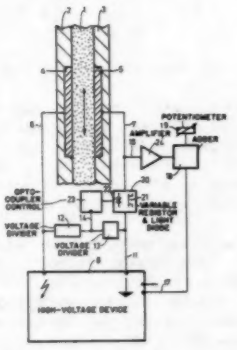
Günter Oppermann, and Fritz Feld, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 172,669, Mar. 24, 1988, abandoned, which is a continuation of Ser. No. 19,894, Feb. 27, 1987, abandoned. This application Dec. 8, 1988, Ser. No. 282,231

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1986, 3609861

Int. Cl.[4] G01N 27/00

U.S. Cl. 73—118.1 **9 Claims**



1. A hydraulic system comprising: means forming a fluid flow channel, an electroviscous fluid in the flow channel, a structural member relatively movable with respect to the fluid for imparting flow to the fluid relative to the flow channel, electrodes in contact with the fluid, means for applying an electrical voltage to the electrodes to vary the viscosity of the fluid, and circuit means connected to the means for applying a voltage to the electrodes for sensing the electrical current across the electrodes to produce a signal corresponding to the flow of the fluid and thereby corresponding to the relative movement of the structural member.

4,898,085

PUSH-IN FLEXIBLE COVER VENT

Frank R. Jarnot, Lantana, Fla., assignor to Airlette Manufacturing Corporation, Lantana, Fla.

Filed Nov. 23, 1988, Ser. No. 275,716
Int. Cl.[4] F24F 7/00
U.S. Cl. 98—1 **15 Claims**

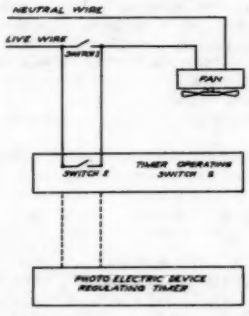
9. A flexible cover vent including superposed first and second stiff panel members incorporating corresponding first and second opposite marginal portions, said first marginal portions being secured together along an elongated zone extending longitudinally of said first marginal portions, said panel members being laterally bowed, substantially throughout, in the direction extending along said zone, said second marginal portions of said panel members being closely spaced apart and adapted to frictionally clampingly receive a flexible cover section margin therebetween extending along one free edge portion of said cover section defining one longitudinal margin of a narrow slit opening formed in said cover section and with said one free edge portion supported in bowed condition between said second marginal portions.

4,898,086

LIVING SPACE VENTILATION

Alan H. Norris, 120 Saddle Mountain Rd., Rome, Ga. 30161

Filed Jul. 5, 1988, Ser. No. 215,404
Int. Cl.[4] F24F 11/00
U.S. Cl. 98—33.1 **5 Claims**



1. A method of ventilating living space with the coolest outside air obtainable in the 24 hour daily cycle by utilising a photoelectric device to provide a signal when the outside light is increasing at dawn, at which time the outside air is at its coolest, and using this signal to actuate electrical contacts which start operating an air moving device propelling air into or out of the living space so as to exchange inside air with outside air thus effecting ventilation of the

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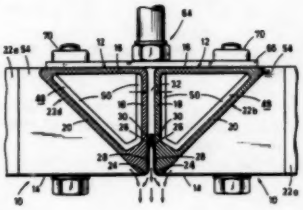
4,898,087

LAMINARIZER

Klaus Fitzner, Betzdorf; Walter Betz, Siegen; Uwe Plitt, Kirchen, and Wolfgang Schmitt, Betzdorf, all of Fed. Rep. of Germany, assignors to Heinrich Nickel GmbH, Betzdorf, Fed. Rep. of Germany

Filed Mar. 17, 1989, Ser. No. 325,363
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1988, 3827918
Int. Cl.[4] F24F 7/10
U.S. Cl. 98—40.1 **26 Claims**



1. In a laminarizer for producing laminar flow for ceilings and walls of clean rooms formed of filter modules, the laminarizer being suspended or held spaced from a cover supporting mechanical filters, the laminarizer including rectangular frames with fabric sheets being stretched onto each rectangular frame, each rectangular frame defining a plane and having side members, each side member being a section of triangular cross-section, the side members each having a surface facing the room, an outer surface extending perpendicularly to the plane of the frame, and a rear surface extending in the plane of the rectangular frame, the fabric sheets resting against and being aligned by the surfaces of the side members facing the room, the improvement comprising the surfaces of the side members facing the room defining narrow alignment contact means for the fabric sheets, the fabric sheets being fastened to the side members at the outer surfaces of the side members.

4,898,088

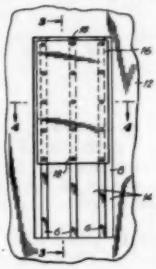
TOTALLY FUSIBLE TUNNEL VENTILATION DAMPER SYSTEM

Norman Lesser, 11 The Bridge, Port Washington, N.Y. 11050, and Fred Horowitz, 997 Sheffield Rd., Teaneck, N.J. 07666

Filed Feb. 2, 1989, Ser. No. 305,189
Int. Cl.[4] F24F 11/04
U.S. Cl. 98—49 **9 Claims**

1. A fusible tunnel ventilation system comprising:
(a) means defining at least one enlarged ventilation opening in the tunnel;
(b) support means transversing said opening;

(c) a sheet of fusible material covering only a portion of said opening and supported by said support means; and



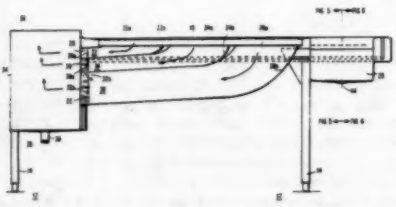
(d) fastening means for fastening said sheet of fusible material to said support means over said portion of said opening.

4,898,089

LAMINAR FLOW WORK TABLE WITH CONTROLLABLE VENTILATION OF A WORK SURFACE

George B. Roos, 22 Berkshire Dr., Berkeley Heights, N.J. 07922

Filed Apr. 28, 1988, Ser. No. 187,216
Int. Cl.[4] B05B 15/12
U.S. Cl. 98—115.1 18 Claims



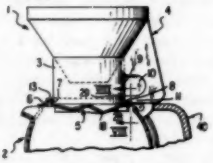
1. A substantially laminar flow work table, comprising:
- a generally horizontal perforated work surface supported at a predetermined distance above a floor surface;
- a first duct means situated below the perforated work surface and communicating with a predetermined first portion of the perforated work surface for permitting a fluid flow to be drawn through the first duct means and through the perforations in the predetermined first portion of the work surface, the first duct means having a predetermined cross sectional configuration and area transverse to the flow of fluid in the first duct means;
- a first controllable baffle means situated in the first duct means for controlling the flow of fluid through the first duct means and the perforations in the predetermined first portion of the work surface, the first baffle means being continuously adjustable between two extreme positions defining minimum and maximum flow conditions, so that the flow of fluid through the first duct means and the perforations in the predetermined first portion of the work surface is adjustable to all flow conditions between the minimum and maximum flow conditions as a continuous function of the position of the first baffle means;
- a second duct means situated below the first duct means and communicating with a predetermined second portion of the perforated work surface for permitting a fluid flow to be drawn through the second duct means and through the perforations in the predetermined second portion of the work surface, the second duct means having a predetermined cross sectional configuration and area transverse to the flow of fluid in the second duct means;
- a second controllable baffle means situated in the second duct means for controlling the flow of fluid through the second duct means and the perforations in the predetermined second portion of the work surface, the second baffle means being continuously adjustable between two extreme positions defining minimum and maximum flow conditions, so that the flow of fluid through the second duct means and the perforations in the predetermined second portion of the work surface is adjustable to all flow conditions between the minimum and maximum flow conditions as a continuous function of the position of the second baffle means; and
- a means for connecting the first and second duct means to a common exhaust manifold.

4,898,090

DEVICE FOR THE PRODUCTION OF AROMA EXTRACTS FROM COFFEE OR TEA

Kwan W. Chan, West Point, Hong Kong, assignor to Melitta-Werke Bentz & Sohn, Minden, Fed. Rep. of Germany

Filed Nov. 3, 1988, Ser. No. 266,589
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1987, 3737203
Int. Cl.[4] A47J 31/02
U.S. Cl. 99—306 12 Claims



1. In a apparatus for the production of aroma extracts from coffee or tea including a filter vessel for receiving coffee or tea and a collecting container for receiving the filtrate from the filter vessel, said filter vessel and said collecting container having cooperating zones for removably supporting said filter vessel on said collecting container, the improvement comprising:
- a plurality of detent means provided on said filter vessel in said zone,
- detent recesses provided on said collecting container in said zone and arranged for receiving respective said detent means when the filter vessel is positioned on said collecting container for releasably locking said filter vessel to said collecting container by said detent means,
- a centering ring mounted on the collecting container; and recesses being disposed in a region adjacent said centering ring;
- a socket forming part of the filter vessel; said centering ring being adapted for receiving said socket; and
- a lid being fixedly connected to the collecting container; said centering ring being a portion of said lid.

4,898,091

SELF VENTING FOOD FRYING APPARATUS

Alexander T. Rozak, #1, 722 - 5A St. N.W., Calgary, Alberta, Canada (T2N 1R4), and Gary G. Calderwood, 2008-31 Ave. S.W., Calgary, Alberta, Canada T2T 1T2

Filed Feb. 6, 1989, Ser. No. 306,920
Int. Cl.[4] A47J 37/12
U.S. Cl. 99—336 19 Claims

1. Self venting food frying apparatus adapted for use in an enclosed space without connection to an outside exhaust system, said apparatus comprising:

a cabinet adapted to be supported at a suitable working height and having a top panel, side panels, a rear panel an upper front panel and a lower front panel at least one of said panels being configured to allow access to the interior of said cabinet;

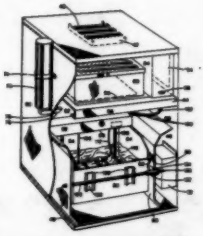
a container located in said cabinet for holding a supply of cooking oil;

means non-integral with said container for heating said container;

a spill tray system comprising an integral means to support said cooking oil container and said means non-integral with said container for heating said container;

means for supporting food products in the cooking oil during the cooking process, said means for supporting food products includes a handle means, and

means to hold said means for supporting food products while automatically lowering said means for supporting food products into said supply of cooking oil for a predetermined time and then raising said means for supporting said means for supporting food products out of said supply of cooking oil, said means for supporting food products



being held by said means to hold by using and resisting the force of gravity and rotation to said means to hold through said means or supporting food products without the requirements for releasable latching means, said means to hold comprising:

(a) means to engage said handle in a slidably fitting relationship while supporting same, said means to engage comprises at least one U-shaped channel device configured to be capable of supporting said handle means along three separate surfaces;

(b) rotatable means attached to said means to engage and capable of rotating in both directions within defined limits, said rotatable means further comprising integral stop means attached to a predetermined location of said U-shaped channel device to engage a fourth surface of said handle means;

(c) means to provide a rotatable force to said rotatable means, and

(d) means to control the means to provide a rotatable force such that the rotatable force is controlled in amount of time of application as well as direction.

4,898,092

FEED GRAIN CONDITIONING APPARATUS

David G. Greer, Anoka, Minn., assignor to AgriChem, Inc., Anoka, Minn.

Filed May 9, 1988, Ser. No. 191,378

Int. Cl.[4] A23N *17/00*

U.S. Cl. 99—487 **25 Claims**

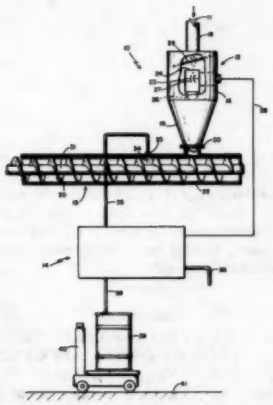
1. A feed grain conditioning apparatus for conditioning of feed grain to bring the moisture content to an approximate target moisture content through the addition of moisture derived at least in part from a water supply, as the feed grain moves in a downstream direction from a first location toward a second location, comprising;

grain conveying means for moving the grain in said downstream direction, having a sensing station and a wetting station located downstream of the sensing station;

a moisture sensor of the type to continuously monitor moisture content of grain and convert the measurement into an electronic signal, positioned at the sensing station located to intercept a sample of passing feed grain for substantially continuous measurement of the moisture content of the sample and translation of the measurement into an electronic signal;

liquid applicator means located at the wetting station positioned to disperse liquid derived at least in part from a water supply upon passing feed grain;

a liquid supply line connected to the liquid applicator means and for connection to the water supply;



an automatic valve connected in the liquid supply line having an electronically actuated valve control movable between relatively open and relatively closed positions to regulate the amount of liquid flow to the liquid applicator means for application to passing feed grain;

means connecting the moisture sensor to the valve control so that the valve control operates responsive to the electronic signal generated by the moisture sensor according to the difference between the moisture content of the grain sample as sensed by the moisture sensor and the target moisture content, said means including calibrated means connected between the moisture sensor and the automatic valve control for regulation of the valve control by the signal from the moisture sensor calibrated according to a known moisture content of the type of feed grain to be conditioned.

4,898,093

FRANKING MACHINE

Werner Haug, Langnau, Switzerland, assignor to Frama AG, Lauperswil, Switzerland

Continuation of Ser. No. 912,401, Sep. 25, 1986, abandoned. This application Oct. 6, 1988, Ser. No. 256,070

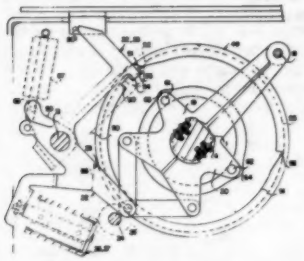
Claims priority, application Switzerland, Nov. 12, 1985, 04841/85

Int. Cl.[4] B41L *47/46*; B41J *1/34*

U.S. Cl. 101—91 **17 Claims**

1. A franking machine of the type having a control unit, said machine comprising: a franking head (2) fixed to one end of a main shaft (1) of said machine, franking value printing wheels (3) mounted in said head and which mesh with a meshing tooth system (28) of racks (4) guided in the main shaft (1) and which, in addition to the meshing tooth system (28), have a driving tooth system (29) and a position sensing tooth system (31), electromagnets (16, 17) being provided to move an associated

driving push rod (5, 6) into engagement with the driving tooth system 29 of one of said racks (4), retaining pawls (44, 44', 45, 45') provided to prevent the rearward movement of said racks and at least one position sensing pawl (19, 20) provided to sense, by engagement into the position sensing tooth system, the correct position thereof, wherein the position sensing pawl



(19, 20) is linked to an electromagnet (26) to be engaged and disengaged with respect to the position sensing tooth system in a position of the main shaft (1) in which the printing wheels (3) are adjusted, a sensor (80) indicating to the control unit the position of said position sensing pawl (19, 20) said engagement and disengagement of said position sensing pawl occuring while said main shaft is at rest.

4,898,094

APPARATUS AND METHOD FOR CONTROLLING A PLURALITY OF CONTINUOUS PAPER PRINTING MACHINES CONNECTED TO EACH OTHER

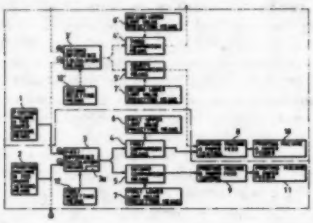
Hideki Doumoto, and Takashi Kimura, both of Hiroshima, Japan, assignors to Ryobi Ltd., Hiroshima, Japan

Filed Jan. 17, 1989, Ser. No. 297,285

Claims priority, application Japan, Jan. 15, 1988, 63-7297/88

Int. Cl.[4] B41F *1/34*; G06F *15/46*

U.S. Cl. 101—485 **8 Claims**



1. A method for controlling a plurality of paper printing machines connected in series for printing on a continuous paper web segmented linearly into frames, each of the printing machines having individual motive power sources, the method comprising the steps of:

generating a first signal every time one sheet of continuous paper is fed into a first one of said printing machines;

generating a second signal every time one sheet of said continuous paper is fed into a second one of said printing machines;

calculating a frame difference signal indicating the difference between the number of said first signals generated and the number of said second signals generated;

comparing said frame difference value with an upper limit value and a lower limit value;

controlling the feed of paper to the first printing machine to temporarily stop the feed of the paper to the first printing machine when said frame difference value is larger than the upper limit value; and

controlling the feed of paper to the second printing machine to temporarily stop the feed of the paper to the second printing machine when said frame difference value is smaller than the lower limit value.

4,898,095

LASER BEAM-DETONATABLE BLASTING CAP

Yoji Tasaki; Koichi Kurokawa; Katsuhide Hattori, all of Aichi; Mikio Takano, Tokyo; Toshikazu Miyajima, Yamato; Toshifumi Sato, Sagamihara, and Katsura Ogasawara, Kodaira, all of Japan, assignors to Nippon Oil and Fats Company, Limited and Kajima Corporation and Kajima Corporation, both of, Japan

Filed Apr. 13, 1988, Ser. No. 180,882

Claims priority, application Japan, Oct. 20, 1986, 61-247597; Apr. 30, 1987, 62-106745; Apr. 30, 1987, 62-106744

Int. Cl.[4] F42B *3/10*

U.S. Cl. 102—201 **9 Claims**

1. A laser beam-detonatable blasting cap, comprising:

a shell member;

a secondary explosive consisting of pentaerythritol tetranitrate charged in an upper portion of said shell member at a loading density of 0.8–1.4 g/cm^3, said secondary explosive containing a laser beam-absorbing black material;

an explosive charged in a lower portion of said shell member at a loading density of 1–1.7 g/cm^3;

a restraining wall arranged around said secondary explosive charged in the upper portion of said shell member; and

an optical fiber arranged in contact with said secondary explosive.

4,898,096

SAFETY DEVICE FOR FIRING CIRCUITS

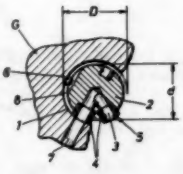
Klaus Ernert, Munich, and Horst Hütter, Tegernsee, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Apr. 12, 1989, Ser. No. 336,705

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1988, 3823627

Int. Cl.[4] F42C *15/00, 15/18*

U.S. Cl. 102—221 **1 Claim**



1. A safety device for a firing apparatus having a housing with a circular bore having openings comprising:

shaft means rotatably supported in the circular bore, the shaft means having a smaller diameter than the diameter of

the circular bore, the shaft means having a plurality of approximately curved firing channels, the channels aligning with the openings when the shaft is in the armed position, the channels having annular overextending boundaries having radially curved outside surfaces which rest against the inside wall of the circular bore.

4,898,097

MODIFIED PROPELLANT INCREMENTS FOR SHORT RANGE TRAINING ROUND PROPULSION SYSTEM

Norman M. Jordan, Wayzata, Minn., and Donald McLaughlin, Joliet, Ill., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 2, 1989, Ser. No. 317,889

Int. Cl.[4] C06B *45/00*

U.S. Cl. 102—283 **16 Claims**

1. A modified propellant increment for an ammunition round, comprising:

(a) a body composed of a combustible propellant material and having a hollow interior, said body being semi-annular in shape defining a mounting cavity; and

(b) means defining a plurality of holes through said hollow body which communicate the exterior of said body with said hollow interior thereof for ensuring complete combustion of said body upon burning thereof.

4,898,098

DEVICE FOR THE RAPID GENERATION OF A SMOKE SCREEN AND A METHOD FOR PREPARING A SMOKE CHARGE

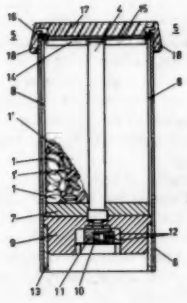
Yvonne Frey, Münsingen; Jörg Kutzli, Höfen; Walter Rauber, Gwatt; Hans Schmocker, Thun, and Markus Tobler, Seftigen, all of Switzerland, assignors to Schweizerische Eidgenossenschaft vertreten durch die Eidg. Munitionsfabrick Thun der Gruppe fÜr RÜstungsdienste, Thun, Switzerland

Filed Nov. 21, 1988, Ser. No. 274,244

Claims priority, application Switzerland, Dec. 24, 1987, 05058/87

Int. Cl.[4] F42B *13/44*

U.S. Cl. 102—334 **21 Claims**



1. A device for generation of a smoke screen in a given target area, wherein a plurality of briquetted smoke charges is accommodated in a container and is simultaneously ignitable and spreadable by a scattering charge, and wherein said smoke charges contain at least one metal oxide and at least one oxygen carrier and/or one halogen carrier, characterized in that the separate smoke charges are arranged randomly and are encapsulated on all sides in a hydrophobic ignition layer.

4,898,099

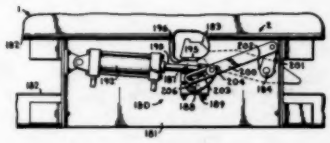
POSITIVE RETRACTION TROLLEY STOP FOR POWER AND FREE CONVEYORS

Gareth D. Summa, Riverside, Mo., assignor to Mid-West Conveyor Co., Inc., Kansas City, Mo.

Continuation-in-part of Ser. No. 926,672, Nov. 4, 1986, Pat. No. 4,790,247. This application Dec. 13, 1988, Ser. No. 283,584

Int. Cl.[4] B61B *13/00*; B61K *7/00*

U.S. Cl. 104—172.4 **21 Claims**



1. A trolley stop mechanism for use in a trolley system including a mobile trolley with movable means engageable by a drive dog of a trolley drive arrangement to move the trolley along a track, said mechanism comprising:

(a) a frame member;

(b) a stop arm connected to on said frame member and movable between a trolley disengaging position to cause a trolley to disengage from a drive dog of a trolley drive mechanism and a trolley engaged position;

(c) stop arm motor means mounted on said frame member, engaged with said stop arm, and movable between a first position and a second position, said motor means positively urging said stop arm to said trolley disengaging position upon said motor means moving from said first position to said second position and releasing said stop arm to move to said trolley disengaged position upon said motor means moving from said second position to said first position; and

(d) one way link means engaged between said stop arm and said stop arm motor means, said link means allowing movement of said stop arm to said trolley disengaging position without interference by said link means and causing positive positioning of said stop arm in said trolley engaged position when said motor means is moved from said second position to said first position.

4,898,100

AERIAL TRANSPORT INSTALLATION WITH TWO SUSPENSION-TRACTION CABLES AND PULLEYS DISPLACED VERTICALLY

Max Brochand, Noyarey, France, assignor to Pomagalski SA, Fontaine, France

Filed Mar. 10, 1988, Ser. No. 166,202

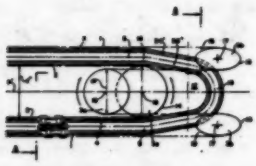
Claims priority, application France, Mar. 11, 1987, 87 03330

Int. Cl.[4] B61B *7/00*

U.S. Cl. 104—192 **19 Claims**

1. An aerial transport installation comprising two parallel, continuously moving suspension-traction cables forming respectively two endless loops, passing over end pulleys respectively located in embarking and disembarking stations; at least one car including disconnectable grippers for clamping the cables, said grippers when connected to the cable bearing on the top part of the cables; said cables cooperating to define a track of circulation for said car in the installation including a track portion of arrival of the car at a station and a track portion of departure of the car from a station, said cables further defining a "horizontal" track plane of arrival and a

"horizontal" track plane of departure, each containing both cables, said endless loops defined by each cable having loop portions which are located at the longitudinally furthest points on their paths of travel of the cables through the station, and said end pulleys including at least one return pulley associated with one of the cables which defines the end of its associated cable's loop and is spaced from said longitudinally furthest point on that cable's path of travel through the station and separates said arrival and departure track portions, means for disconnecting and connecting the grippers to the cables and means for supporting and guiding the car located in the embarking and disembarking stations, such that the car is engaged between, driven and conveyed by the cables and that in the embarking and disembarking stations the car is totally disengaged and dissociated from the cables whereby in at least one of the embarking and disembarking stations, for the track



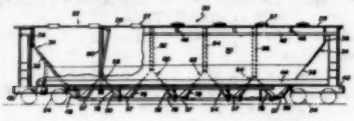
portion of arrival and for the track portion of departure defined by the cables, respective zones of cooperation of one of the cables with the end pulleys in the track portions of arrival and departure are displaced longitudinally in relation to the zones of cooperation of the other cable with the end pulleys such that a longitudinal free space is provided between the respective longitudinally farthest sections of the loops of the cables in relation to the station; at least one return pulley of at least one loop formed by a cable being recessed towards the inside of the track of circulation of the car, guiding means for causing the cable to make a half-turn upstream and downstream of the return pulley, and at least one of said return pulleys of at least one loop formed by a cable being substantially parallel to the track portions of arrival and of departure whilst being in a different plane from at least one of said track portions.

4,898,101

VEHICLE HOPPER BODY WITH INTERNAL REINFORCING MEMBERS

Lynn J. Harter, Atlanta, Ga., assignor to Thrall Car Manufacturing Company, Chicago Heights, Ill.

Filed Sep. 19, 1988, Ser. No. 245,572
Int. Cl.[4] B61D *3/00, 7/00*
U.S. Cl. 105—247 **5 Claims**



1. A hopper vehicle body comprising:

an elongated shell having a top and opposing side walls and having an arcuate lateral sectional profile in the general shape of a horseshoe with the side walls terminating in a lower horizontal edge;

each end of the elongated shell being closed by an end wall means;

the elongated shell having a plurality of spaced apart lateral crossridge means extending between the opposing side walls near but above the horizontal edges;

a plurality of discharge hoppers enclosing the vehicle body beneath and connected to the elongated shell;

each of the lateral crossridge means constituting a common top separating adjoining discharge hoppers;

a plurality of horseshoe-shaped reinforcement members located inside of the elongated shell;

each of the horseshoe-shaped reinforcements being positioned along a plane lateral to the elongated shell so as to intersect each crossridge means;

each horseshoe-shaped reinforcement having a hat shape in lateral section and comprising a top, a pair of opposing sides extending outward from the top side edges, and a rim parallel to the top extending outward from each side and terminating in an edge;

each rim of the hat-shaped reinforcement being joined to the elongated-shell; and

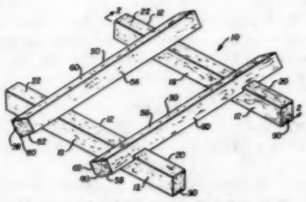
each horseshoe-shaped reinforcement member terminating in two lower opposing ends, with one of each of the two ends being joined to and of an adjoining crossridge means.

4,898,102

LOAD CARRYING SKID ASSEMBLY

Donald W. Thebeau, 12 Holly Hill Dr., Freedom, Pa. 15042

Filed Jul. 10, 1989, Ser. No. 377,557
Int. Cl.[4] B65D *19/31*
U.S. Cl. 108—56.1 **6 Claims**



1. A load carrying skid assembly comprising:

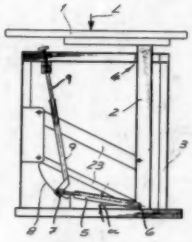
at least a pair of spaced elongated base members, each having a generally rectangular transverse cross-section, and a longitudinal load bearing upper face and an opposite longitudinal surface engaging lower face, and longitudinal side faces; each base member defining oppositely disposed first and second notches inclined at obtuse angles toward each other and toward the transverse centerline of the base member, each notch extending through the side faces of the base member, each notch also extending from an open upper end at said upper face of said base member to a closed lower end intermediate said upper and lower faces of said base member, each notch having inner and outer walls connected at their bottom ends by said lower end; and

at least a pair of spaced elongated load engaging members each having a generally rectangular transverse cross-section removably interconnected with and extending laterally across said base members; each of said load engaging members having a longitudinal load engaging first side, an opposite second side, a longitudinal third side, and an opposite fourth side; said load engaging members mated in said first and second notches of said base members to dispose said load engaging first sides at obtuse angles extending away from each other and away from the transverse centerlines of said base members.

4,898,103
DESK CONSTRUCTION

Eskild Pontoppidan, Copenhagen, Denmark, and Willy Fleischer, Neukircher Mühle 26, D 4300 Essen, Fed. Rep. of Germany (16,BRD), assignors to Willy Fleischer, Bocum, Fed. Rep. of Germany and Metallwarenfabrik GmbH & Co. KG

Filed Jun. 15, 1988, Ser. No. 207,271
Claims priority, application Denmark, Jun. 16, 1987, 3058/87; Fed. Rep. of Germany, May 19, 1988, 3817102
Int. Cl.[4] A47B 9/00
U.S. Cl. 108—144 9 Claims



1. A desk, particularly for work stations, comprising:

a desk top which is vertically adjustable between two end positions and has at least one vertical guide member; a desk frame including spaced-apart columns, each column having a vertical hollow bottom part and a top part telescopic therein;

a cross-member interconnecting said bottom parts;

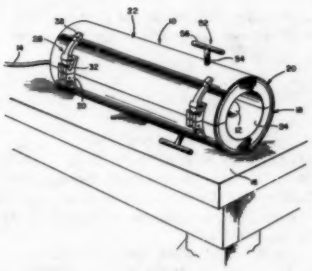
height adjusting means connected to said cross-member for moving said top part with respect to said bottom part to move said desk vertically, said height adjusting means including a telescopic leg member having a first end pivotally connected with respect to said cross-member and a second end, a curved rail member pivotally mounted with respect to said cross-member, said second end of said telescopic leg member being propped against said curved rail, a spindle actuator means connected with a hand wheel for adjusting the position of the telescopic member second end relative to the rail, thereby pivoting the rail and pivoting the telescopic member, said curved rail defining a curve such that the position of the propped telescopic member and force components acting on the top support elements are essentially equal at each of the spaced-apart columns, a traction wheel mounted for rotation relative to said cross-member, a connection lever pivotally mounted to said curved rail member, said traction wheel being connected to a grooved reel member, said grooved reel member rotating with said traction wheel, a flexible traction wheel actuator element connected to said pivot and connected to said grooved reel, said flexible traction element rolling up and unrolling from said grooved reel to rotate said traction wheel upon movement of said pivot in response to said second end of said telescopic member being adjusted along said rail, rotation of said traction wheel causing said desk top to move vertically.

4,898,104
ARMING AND HANDLING SHIELD FOR OILFIELD AND OTHER EXPLOSIVE DEVICES

Thomas D. Savoy, 216 Malibou Blvd., and Herbert J. Wallace, 121 Royce St., both of Houma, La. 71040

Filed Oct. 18, 1988, Ser. No. 259,142
Int. Cl.[4] E05G 3/00; E06B 9/00
U.S. Cl. 109—1 R 9 Claims

1. An arming and handling shield for explosive devices comprising an elongated rigid shell having a hollow interior and end openings and means extending into the interior of the shell for supporting and positioning an explosive device within the hollow interior of the shell, said shell being constructed of material resistant to forces generated when the explosive device is detonated and directing the forces from the end openings in the shell to protect adjacent personnel from injury, said shell being substantially cylindrical in configuration and formed by a pair of elongated semi-cylindrical shell sections which are hingedly connected along one longitudinal edge thereof and provided with releasable latch means along the other longitudinal edge thereof to enable the semi-cylindrical shell sections to be pivoted between open and closed positions to facilitate assembly of the explosive device in the shell and removal of the shell from the explosive device after the explosive device has been assembled, armed and placed in a position where no further danger exists for adjacent personnel, said shell including concentrically arranged inner and outer walls of metal which are spaced apart to define an internal cavity



between the inner and outer walls, a plurality of layers of concussion resistant material positioned between the inner and outer walls and filling the inner cavity to resist radial concussion forces and shrapnel and diverting such forces and shrapnel toward the end openings in the shell and away from adjacent personnel, said layers of concussion resistant material including multiple layers of aramid fiber cloth, said concussion resistant material includes approximately 40 layers of "Kevlar 29", the interior of said shell being cylindrical and the end openings being the same diameter as the interior of the shell, the inner wall of the shell being aluminum and approximately ¼" thick and the outer wall also being aluminum with the inner wall at least partially confining the initial concussion force in the event the explosive device is detonated and the layered concussion resistant material further dissipating the concussion forces with the outer wall completely stopping any remaining forces and debris which may have penetrated the layered concussion resistant material.

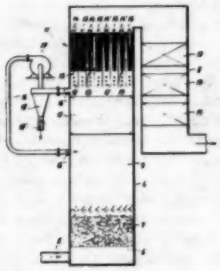
4,898,105
FILTER DEVICE

Louis M. Rappoldt, DV Ugchelen, and Peter H. DeHaan, PE Delft, both of Netherlands, assignors to Nederlandse Organisatie voor Toegepastnatuurwetenschappelijk Onderzoek TNO, The Hague, Netherlands

Filed Jan. 10, 1989, Ser. No. 295,345
Int. Cl.[4] F23G 5/00
U.S. Cl. 110—245 10 Claims

1. Filter device for removing entrained fine solid particles from a gas stream, comprising a charging system for giving an electric charge to the particles and an electrified granular filter which is situated downstream of the charging system and which is formed by at least one layer of granules of a non electrically conducting material and means for forming an electrical field across the granules which comprise a polariza-

tion electrode at one side and an earthed electrode at the other side, in which the granule layer is formed by a self-supporting,



highly porous body, constructed of granules which are sintered together to form a sintered self-supporting granule layer.

4,898,106

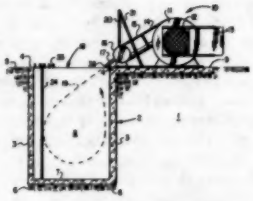
COMBUSTION METHOD AND APPARATUS

Roy G. Bellew, Thermopolis; Donald P. Dunn, Gillette, both of Wyo.; Charles T. Stilwell, Midland, Tex., and Johnny D. Wood, Moorcroft, Wyo., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jul. 10, 1989, Ser. No. 378,340

Int. Cl.[4] F23G *00/00*; F23J *15/00*; F24F *9/00*

U.S. Cl. 110—346 **20 Claims**



1. In a method for burning a combustible material in a container having closed sides and bottom and an open top, which sides and bottom collectively define an interior burning chamber of finite volume and wherein during burning a sheet of oxygen containing gas is formed in an elongate opening and then forced into the interior of said chamber through said open top, said elongate opening having a center section and end sections on either side of said center section, said sheet of gas having by reason of said elongate opening a width which extends across a substantial portion of said open top, said elongate opening being angled with respect to said open top so that said sheet of gas impinges on at least one of said closed sides and thereafter circulates around the interior of said container before leaving same, the improvement comprising, when forming said sheet of gas in said elongate opening diverting a majority of said gas to said end sections while leaving a minority of said gas for said center section, and varying the interior volume of said burning chamber so that the combined effect of said gas sheet and adjusted interior volume in relation to the specific material being burned in said chamber yield an efficient combustion process as evidenced by minimal production of opaque smoke.

4,898,107

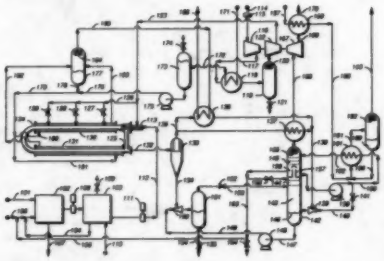
PRESSURIZED WET COMBUSTION OF WASTES IN THE VAPOR PHASE

Norman L. Dickinson, Monte Sereno, Calif., assignor to Dipac Associates, Monte Sereno, Calif.

Continuation-in-part of Ser. No. 100,531, Sep. 24, 1987, abandoned, which is a continuation-in-part of Ser. No. 813,486, Dec. 26, 1985, Pat. No. 4,714,032. This application Jan. 9, 1989, Ser. No. 294,424

Int. Cl.[4] F23G *7/04*

U.S. Cl. 110—346 **26 Claims**



1. A pressurized combustion process in which an aqueous waste is mixed with recycled combustion products and an oxygen-containing gas, and combustible constituents burned at supercritical temperature and subcritical pressure, with respect to water, net combustion products being cooled below their dewpoint at essentially combustion pressure, forming an aqueous slurry of non-combustible constituents and a wet flue gas.

4,898,108

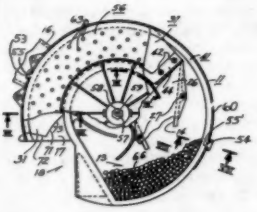
SEED SINGULATOR FOR AGRICULTURAL PLANTER

William C. McDermott, Kansas City, Mo., assignor to Deutz-Allis Corporation, Norcross, Ga.

Continuation-in-part of Ser. No. 245,727, Sep. 19, 1988, abandoned. This application Oct. 13, 1988, Ser. No. 257,183

Int. Cl.[4] A01C *7/04*; B23Q *7/02*

U.S. Cl. 111—185 **9 Claims**



1. An agricultural planter having an air-type seed singulator including a housing with a seed cavity to which bulk seed and pressurized air are supplied and a seed drop portion at the lower part of said housing and a vertical seed singulating disc mounted for rotation about a horizontal axis having a generally flat sealing face including an annular area presenting circumferentially spaced seed pockets defining a plurality of concentric circles greater than two coaxial with said horizontal axis, said pockets sequentially communicating with said seed cavity and said seed drop portion when said disc is rotated in a predetermined direction, characterized by

a first flat axially facing arcuate sealing surface extending in an arc in said predetermined direction about the outer

periphery of said housing between the bottom of the seed cavity to said seed drop portion,

a second flat axially facing sealing surface on said housing extending from the circumferential end of said first sealing surface at the bottom of said seed cavity radially inward relative to said horizontal axis a predetermined distance and then curving in a direction opposite to said predetermined direction to present an arcuate portion in a generally concentric and radially inward spaced relation to a part of said first sealing surface near the other circumferential end of the latter, said portion of said second sealing surface and said part of said first sealing surface forming circumferentially lapped segments, said sealing surfaces at least partially circumscribing said cavity,

an arcuate trough in said housing disposed between said lapped segments,

a resilient sealing pad operatively disposed within said trough, said pad having a flat surface in sealing engagement with said annular area of said seed singulating disc, said sealing pad having an end at said seed drop portion disposed at right angles to said flat surface, said end having parts disposed in angular relation to one another whereby predetermined spacing of seeds is effected during rotation of said seed disc,

a generally flat wear ring secured to said housing and of a configuration to be in covering relation to said sealing surfaces, said wear ring being in axial sealing engagement with said flat sealing face of said disc and

a releasable fastening member releasably securing said pad and said wear ring to said housing.

4,898,109

DEVICE FOR SEWING A COLLAR ON TO A BODY OF AN ARTICLE OF CLOTHING

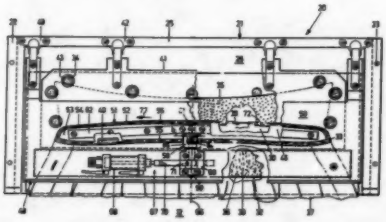
Hans Scholl, Oerlinghausen-Lipperreihe, Fed. Rep. of Germany, assignor to Kochs Adler Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 23, 1988, Ser. No. 235,291

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1987, 3730406

Int. Cl.[4] D05B *3/00*

U.S. Cl. 112—121.14 **12 Claims**



1. Device for sewing a collar, formed by two lower collar parts (30, 46) on to a body (37) of an article of clothing, particularly a shirt or blouse, comprising a sewing head (2); and at least one workpiece holder (20) for receiving workpieces, the sewing head (2) and workpiece holder (20) being movable in a plane (x-y plane) relative to one another to produce a seam (55) for joining the workpieces; wherein the workpiece holder (20) has

a first nest (29) for receiving a first lower collar part (30) and having at least partially a form which is identical to the form of said first lower collar part; devices for receiving and positioning a body (37) of an article of clothing partially overlapping with the first nest (29) for the first lower collar part (30);

a second nest (44) for a second lower collar part (46), which nest has a form which is at least partially identical to the form of said second lower collar part (46) and is arranged above these devices and can be lowered towards then; and

a holding device which is arranged above the second nest (44) and can be lowered on to the second nest (44).

7. Device for sewing a collar, formed by two lower collar parts (30, 46) and an upper collar (35) on to a body (37) of an article of clothing, particularly a shirt or blouse, comprising a sewing head (2); at least one workpiece holder (20) for receiving workpieces, the sewing head (2) and workpiece holder (20) being movable in a plane (x-y plane) relative to one another to produce a seam (55) for joining the workpieces; wherein the workpiece holder (20) has

a first nest (29) for receiving a first lower collar part (30) and having at least partially a form which is identical to the form of said first lower collar part;

devices for receiving and positioning a body (37) of an article of clothing and of an upper collar (35) each partially overlapping with the first nest (29) for the first lower collar part (30);

a second nest (44) for a second lower collar part (46), which nest has a form which is at least partially identical to the form of said second lower collar part (46) and is arranged above these devices and can be lowered towards them; and

a holding device which is arranged above and can be lowered on to the second nest (44).

4,898,110

PATTERN-MATCHING SEWING MACHINE

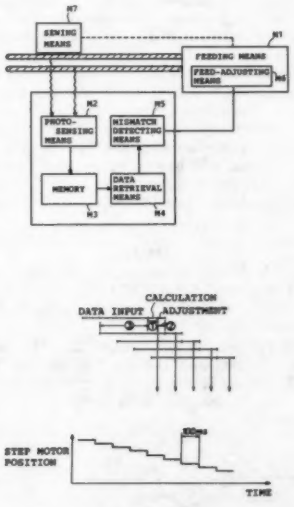
Etsuzo Nomura, Kasugai; Hirokazu Takeuchi; Shigeru Suzuki, both of Nagoya; Kazunori Irie, Ichinomiya, and Hirosumi Itoh, Nagoya, all of Japan, assignors to Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jan. 27, 1989, Ser. No. 302,679

Claims priority, application Japan, Jan. 28, 1988, 63-17696

Int. Cl.[4] D05B *27/06, 27/08*

U.S. Cl. 112—314 **4 Claims**



1. A sewing machine for sewing two sheets having the same pattern comprising:

first and second feeding means each for intermittently feeding one of the sheets;

first and second photo-sensing means each for optically

sensing the pattern on one of the sheets during feeding and for generating photo-intensity data of a plurality of points on the sheet;

a memory for sequentially storing a plurality of the photo-intensity data;

a data retrieval means for retrieving a predetermined number of the newest photo-intensity data from the memory every preset cycle time, the predetermined number corresponding to a preset feeding distance of the sheets, and the preset cycle time being shorter than a feeding time for the preset feeding distance;

a mismatch detecting means for calculating a mismatch distance of the patterns on the two sheets using the predetermined number of retrieved data, the calculation being finished within the preset cycle time; and

a feed-adjusting means, based on the calculated mismatch distance, for adjusting one of the feeding means to match the patterns.

4,898,111

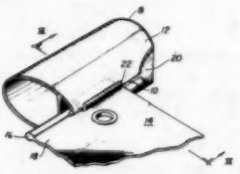
CATAMARAN SAILBOAT USER SUPPORT PLATFORMS AND PACKAGED ELEMENTS THEREFORE

John Hackney, 12420 Kelso Rd., Thonotosassa, Fla. 33592

Filed May 2, 1988, Ser. No. 188,844

Int. Cl.[4] B63B *1/00*

U.S. Cl. 114—61 **3 Claims**



1. In a catamaran sailboat equipped with a user support platform comprising a pair of parallel metal support tubes spaced apart approximately the beam of the sailboat, each said tube having a longitudinal slot on the inboard side thereof, and a trampoline stretched between said tubes by having beaded edges on the outboard sides thereof captured within said tube slots, the improvement for preventing the trampoline from disengaging from its support tubes that comprises a plurality of retainers spaced apart along said tube slots interposed between said tube slots and said beaded edges, said retainers being elongate web elements of substantially uniform web thickness and having a hook-like cross-section.

4,898,112

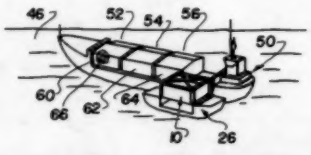
CARGO SHIP HAVING STOWAGE SPACE FOR FLOATABLE SELF-PROPELLED WAREHOUSES

John J. McGlew, and John J. McGlew, Jr., both of P.O. Box 823, Tuxedo Park, N.Y. 10987

Continuation of Ser. No. 400,938, Jul. 22, 1982, abandoned, which is a continuation of Ser. No. 896,050, Apr. 13, 1978, abandoned. This application Aug. 27, 1985, Ser. No. 770,357

Int. Cl.[4] B63B *35/42*

U.S. Cl. 114—255 **9 Claims**



1. A floatable cargo storage container comprises a block-like structure having an interior cargo storage space, at least one side wall having an opening therein through which the cargo may be loaded, means for closing said opening, said cargo storage container including a tank section defining a flotation chamber, means for ballasting and unballasting said flotation chamber for raising and lowering the container structure in the sea, and a plurality of tubular spaces in said storage container defining leg receiving recesses, a leg associated with each receiving space, means for extending and retracting said legs, said legs being of a length substantially equal to the height of said block-like structure and being extendable from the bottom of said structure by an amount substantially equal to the height of said structure so that they may support said structure on the sea bed, and propulsion means associated with said legs for moving the container through water and over land.

4,898,113

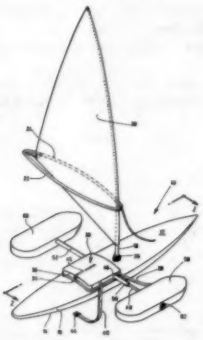
OUT-RIGGER ASSEMBLY

Robin R. Tapley, Dwight; James W. Hatkoski, Huntsville, and Richard J. Hatkoski, Dwight, all of Canada, assignors to Richard Hatkoski, Ontario, Canada

Filed Nov. 7, 1988, Ser. No. 268,294

Int. Cl.[4] B63B *43/04*

U.S. Cl. 114—283 **12 Claims**



1. An out-rigger assembly for use with a sail-board having a top surface and an undersurface and which assembly comprises:

an essentially planar central deck having an unencumbered top surface and adapted to be disposed on said top surface of said sail-board without significantly restricting standing and walking movement of an operator on said sail-board;

at least one releasable fastening strap adapted pass around said sail-board and removably to secure said central deck in position on said top surface of said sail-board;

first and second support means extending transversely outwardly from said centre deck from opposite side edges thereof; and

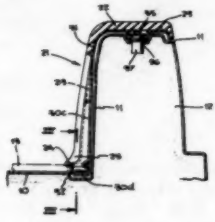
first and second pontoons releasably secured to respective ones of said first and second support means so as to be disposed in spaced apart and mutually parallel disposition relative to said sail-board on opposite transverse sides thereof when said central deck is secured in position on said sail-board.

4,898,114

FIN PAD OF SMALL MARINE CRAFT

Yukio Asakura, Hyogo, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha dba Kawasaki Heavy Industries, Ltd., Kobe, Japan

Filed Feb. 23, 1989, Ser. No. 314,455
Claims priority, application Japan, Feb. 23, 1988, 63-23689[U]
Int. Cl.[4] B63B 29/00
U.S. Cl. 114—343 1 Claim



1. A fin pad for covering one of the upstanding fins positioned on both sides of a deck floor and center line of a small watercraft, said floor being covered by a mat between said fins, said pad comprising:

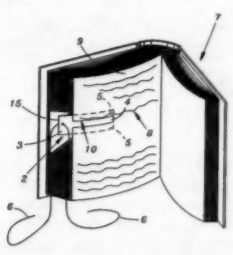
a cushion having an inner lower edge, which curves toward a mat and generally toward a centerline of a small watercraft and overlies an adjacent edge of said mat, a back sheet covered by said cushion and adapted to be fixed to at least one of a pair of fins of said watercraft, and anchor means provided on an inner lower edge of said back sheet to engage a part of said floor.

4,898,115

LINE IDENTIFYING BOOKMARK

Iris E. Bowlay-Williams, 6833 Sepulveda Blvd., #310, Van Nuys, Calif. 91405

Filed Mar. 14, 1989, Ser. No. 323,339
Int. Cl.[4] B42D 9/00
U.S. Cl. 116—236 5 Claims



1. A bookmark identifying a particular line and page of a book comprising:

a generally rectangular member having a first portion extending from the page to be identified and a second portion fitting about the page to be identified;

said second portion having a first segment disposable on the page to be identified and formed to identify a particular line, and a second segment disposable on the rear of the page to be identified;

said first and second segments being cooperative to hold the bookmark in place on a particular line and page of the book; and

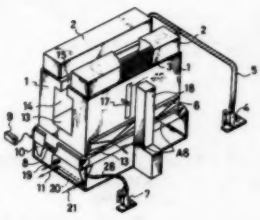
at least one tying member attached to said rectangular member, said tying member having sufficient length to extend around the outside of the book and hold the book in a closed configuration while the bookmark is held in place on the particular line and page of the book.

4,898,116

POWDER COATING BOOTH

Katsutoshi Kozoe, Tokyo; Nobuo Furuya, Yokohama; Shinichi Kimura, Chiba; Yasunari Okamoto, Kawasaki; Mitsuyoshi Kamada, Yachiyo; Tatsuo Sugimoto, Chiba; Takehiko Ueno, Tokyo; Kenjiro Shimizu, Kohnosu, and Tsutomu Itoh, Tokyo, all of Japan, assignors to Onoda Cement Company, Ltd., Onoda, Japan

Filed Sep. 7, 1988, Ser. No. 241,343
Claims priority, application Japan, Sep. 14, 1987, 62-230499; Jan. 14, 1988, 63-006263
Int. Cl.[4] B05C 1/02, 5/00, 13/00
U.S. Cl. 118—621 12 Claims



1. A powder coating booth comprising:

a sidewall formed from an insulating material or a semiconductor;

a ceiling having a function of downwardly supplying air;

a bottom opened over a conveyor belt;

means for forming an electric field extending to said conveyor;

a suction device for drawing powder paint, said suction device being provided in said sidewall near said bottom; and

a blowing-type static eliminator facing a portion of said conveyor belt positioned at a distance from said bottom.

4,898,117

SOLDER DEPOSITION SYSTEM

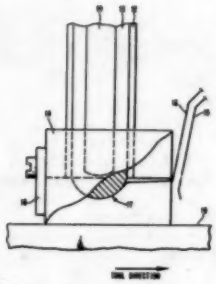
Peter G. Ledermann, Pleasantville, and Lua Thanh Nguyen, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 15, 1988, Ser. No. 181,775
Int. Cl.[4] B05C 1/02
U.S. Cl. 118—665 10 Claims

1. Apparatus for depositing solder on a series of separated conductive surfaces comprising:

a housing having means defining a reservoir for liquid solder and means defining an outlet for liquid solder in the form of a foot from said reservoir.

means for sensing the position of the liquid solder foot emerging from said outlet, and



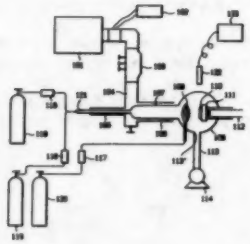
means for breaking a solder film existing between said liquid solder foot and one of said separated conductive surfaces.

4,898,118

APPARATUS FOR FORMING FUNCTIONAL DEPOSITED FILM BY MICROWAVE PLASMA CVD PROCESS

Tsutomu Murakami, Nagahama, and Masahiro Kanai, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 3, 1988, Ser. No. 252,520
Claims priority, application Japan, Oct. 5, 1987, 62-249855
Int. Cl.[4] C23C *16/00*
U.S. Cl. 118—723 **2 Claims**



1. Apparatus for forming a deposited film by a microwave plasma CVD process comprising introducing a film-forming raw material gas into a reaction vessel capable of being vacuum sealed, and generating a microwave-excited plasma in the reaction vessel to deposit a film on a substrate for film deposition disposed in the reaction vessel, the apparatus comprising a rectangular waveguide for transmitting microwave energy, a pair of microwave cutoff cavities having different cutoff frequencies, the cavities being oppositely disposed on opposite sides of the waveguide, and a reaction vessel disposed to penetrate through the waveguide and the microwave cutoff cavities, wherein a raw material gas inlet is provided at one end of the reaction vessel, and a film deposition space is provided at the other end of the reaction vessel.

4,898,119

REMOTE CONTROL ANIMAL COLLAR

David M. Tsai, 124 Benedict La., Raleigh, N.C. 27614

Filed Aug. 11, 1988, Ser. No. 230,957
Int. Cl.[4] A01K *15/00*
U.S. Cl. 119—29 **10 Claims**

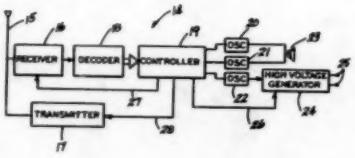
1. An adjustable animal training collar comprising in combination: a flexible strap at least a portion of which is adapted to encircle the neck of an animal, a radio receiver means for receiving a remotely broadcast radio signal and converting it to an on/off switching signal, an electric power source connected to an electric motor having a turning shaft which engages and turns a capstan connected to said strap such that turning of said capstan by said motor causes tightening of said strap around the neck of said animals, turning of said capstan being controlled by clutch means connected therewith and activated by switch means connected through said radio receiver to said power source to transmit power to said switch means on receipt of said on signal and to terminate said power on receipt of said off signal.

4,898,120

ANIMAL TRAINING AND RESTRAINING SYSTEM

Peter W. Brose, Harwinton, Conn., assignor to Torrington Product Ventures, Inc., New Hartford, Conn.

Filed Jun. 16, 1988, Ser. No. 207,541
Int. Cl.[4] A01K *15/02*
U.S. Cl. 119—29 **19 Claims**



4. An animal training system comprising a central logic unit including a radio transmitter and receiver, a unit for mounting on the animal which includes a transmitter and receiver, said central transmitter and receiver being effective to transmit signals to the animal unit and receive identification signals from the animal transmitter, means at said central logic unit for measuring the strength of a signal from the animal transmitter, means at said central logic unit for comparison of the measured strength of a signal from the animal transmitter with stored data relative to distance from the central logic unit, and means for initiating transmission of one a plurality of types of control signals to the animal.

4,898,121

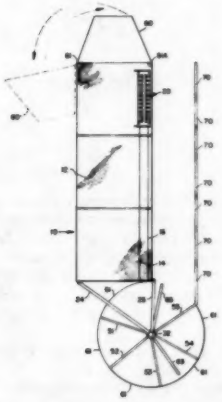
PORTABLE WORKING CHUTE SYSTEM

Charles E. Reynolds, P.O. Box 186, Moorcroft, Wyo. 82721

Filed Aug. 8, 1988, Ser. No. 229,652
Int. Cl.[4] A01K *29/00*
U.S. Cl. 119—98 **17 Claims**

1. Portable working chute system comprising:

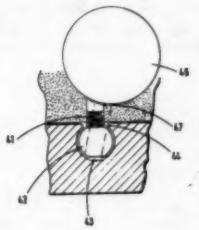
(a) an elongated platform having first and second ends; said platform providing a working surface;
(b) wheels adapted to support said platform for transport;
(c) upright members attached to said platform and forming a passageway extending longitudinally over said platform;
(d) a tub pen attached to said second end of said platform, said tub pen comprising (i) a frame member, (ii) a plurality of upright support members attached to said frame member, (iii) a plurality of curved panel sections detachably secured to said support members and forming a tub pen having an inlet opening and an outlet opening, wherein said outlet opening communicates with said passageway;



and (iv) at least one gate pivotably attached to said frame member and being adapted to pivot within said tub pen; wherein said tub pen is adapted to be disassembled and carried on said platform for transport;
(e) leg members attached to said platform which are adapted to selectively raise and lower said first end of said platform; and
(f) a gooseneck hitch member pivotably attached to said first end of said platform; wherein said hitch member is pivotable between (i) a towing position in which said hitch member is longitudinally aligned with said platform, and (ii) a resting position in which said hitch member is pivoted to one side of said platform.

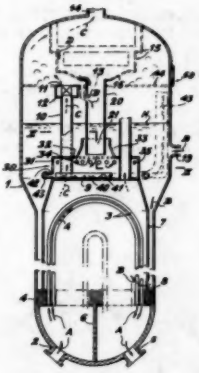
4,898,122
TILE MOUNTING SYSTEM
James Black, c/o The Manor House, Lawrence Street, York, Y01 3EF, England
Filed Jul. 6, 1988, Ser. No. 215,636
Claims priority, application United Kingdom, Jul. 6, 1987, 8715871
Int. Cl.[4] F22B *37/00*
U.S. Cl. 122—6 A **7 Claims**

1. A combination of ceramic tiles and locating elements for locating and supporting the ceramic tiles relative to a main support to which the locating elements are attached, the locating elements each having a elongate body, an enlarged head at one end and at the opposed end is attachable to the main support; the ceramic tiles each defining a recess in its rear surface, the recess having a substantially corresponding cross-section to that of the enlarged head of the elongate locating elements in the axial direction thereof, the diametric width of the recess being greater than the width of the opening to the recess and the width of the opening being substantially wider than the width of the elongate body of the locating member so that the locating member is rotatable within the recess in a direction transverse to the longitudinal axis of the locating member to



move the said elongate body between opposed sides of the recess opening.

4,898,123
WATER CLEANSING TANK FOR STEAM GENERATOR
Alain Holcblat, Issly les Moulineaux, France, assignor to Framatome, Courbevoie, France
Filed Jun. 20, 1988, Ser. No. 208,624
Claims priority, application France, Jun. 18, 1987, 87 08517
Int. Cl.[4] F22B *37/18, 37/48*
U.S. Cl. 122—379 **9 Claims**



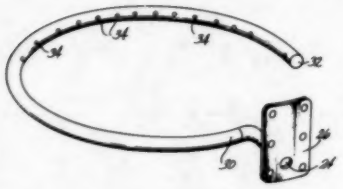
1. A tank for the cleansing of water flowing in a steam generator, said water being separated from the steam by drying means and having flowed through a tube for the inlet of water into the tank, said tank comprising a casing consisting of a bottom, a side wall drilled with water-removal holes and a roof drilled with a central conduit into which the lower end of the tube penetrates.

4,898,124
SCALE AGITATOR
Dirk N. Granberg, Fenton, Mich.; Frank H. Suchomel, and Robert W. Ryno, both of El Paso, Tex., assignors to A. O. Smith Corporation, Milwaukee, Wis.
Filed Jan. 11, 1989, Ser. No. 296,187
Int. Cl.[4] F22B *37/54, 37/18, 37/52*
U.S. Cl. 122—382 **17 Claims**

1. In a liquid heater having a tank in which the liquid is heated, a liquid inlet near the base of the tank, and a fitting at the liquid inlet, one side of which is in communication with incoming liquid, and the other side of which is in communica-

tion with the tank's interior, an inlet liquid distributor comprising:

a flexible elongated tube, one end of which is plugged and the other end of which is adapted to be mounted to the liquid inlet fitting so that the tube can be inserted into and withdrawn from the tank through the liquid inlet and held



in place by the fitting, the tube being longer than the diameter of the tank so that the tank's interior wall forces the tube to flex into a curve when the tube is inserted into the tank; and

a plurality of openings along the tube arranged for distributing the inlet liquid so that the inlet liquid is distributed in different directions by the different openings.

4,898,125

CYLINDER HEAD COVER WITH SUCTION PIPE ARRANGEMENT FOR AN INTERNAL COMBUSTION ENGINE

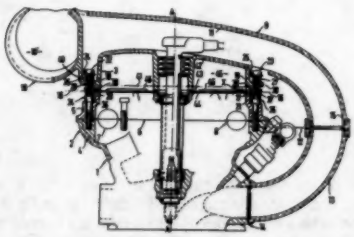
Herbert Ampferer, Sachsenheim, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Weissach, Fed. Rep. of Germany

Filed Sep. 13, 1988, Ser. No. 243,603

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1987, 3730817

Int. Cl.[4] F22E *9/08*

U.S. Cl. 123—52 MC **15 Claims**



1. A cylinder head cover with a suction pipe arrangement for an internal combustion engine of a four-cycle reciprocating-piston type construction which form a structural unit, comprising retaining means including seal means and threaded means for retaining the cylinder head cover at the cylinder head of the internal combustion engine, and threaded means having heads and extending substantially perpendicularly to a separating plane of the cylinder head cover and the cylinder head, elastic means arranged between the heads of the threaded means and support means of the structural unit extending substantially parallel to said separating plane for attaching the heads to the support means, wherein the cylinder head is of multi-partite configuration and the threaded means are screwed into head portions of coaxially arranged fastening bolts which retain the multi-partite cylinder head in position.

4,898,126

INTERNAL COMBUSTION ENGINE WITH CATALYTIC IGNITION

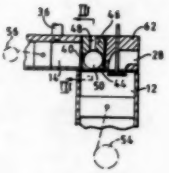
Dan Merritt, 139 Baginton Rd., Coventry, West Midlands, Great Britain

Continuation of Ser. No. 18,191, Feb. 24, 1987, abandoned. This application Jan. 30, 1989, Ser. No. 303,019

Claims priority, application United Kingdom, Feb. 25, 1986, 8604635; Jul. 11, 1986, 8616982; Dec. 9, 1986, 8629304

Int. Cl.[4] F02B *19/16, 25/26;* **F02P** *23/02*

U.S. Cl. 123—53 A **23 Claims**



1. An internal combustion engine comprising at least one pair of first and second cylinders interconnected at their head ends by a combustion chamber, said first cylinder having a larger swept volume than said second cylinder;

means for delivering a charge of air to said first cylinder and means for delivering a charge of fuel to said second cylinder, said second cylinder being a fuel management cylinder;

substantially continuous ignition means in said combustion chamber;

respective first and second pistons movable in said cylinders towards and away from said combustion chamber;

means for restricting movement of fuel/air mixture from said fuel management cylinder into said combustion chamber until combustion is required;

and mixing means for delivering air with a vortex motion from the first cylinder to the combustion chamber for assisting rapid mixing in said combustion chamber of a fuel/air mixture from said fuel management cylinder with air from said first cylinder.

4,898,127

TWO-STROKE CYCLE ENGINE WITH VACUUM PULSE BALANCING SYSTEM

George E. Phillips, Oshkosh, and John M. Griffiths, Fond du Lac, both of Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Mar. 20, 1989, Ser. No. 326,120

Int. Cl.[4] F02B *33/04*

U.S. Cl. 123—73 A **9 Claims**

1. A two-stroke cycle internal combustion engine, comprising:

a plurality of cylinders;

a reciprocable piston slidably mounted in each said cylinder, said piston creating a vacuum pulse during a portion of its reciprocation;

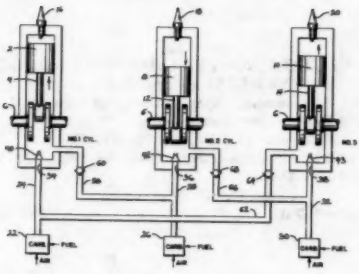
separate air-fuel mixture supply means associated with each said cylinder, said air-fuel mixture being drawn into said cylinder when said vacuum pulse is created by movement of said piston therein;

means communicating air-fuel mixture from each said separate air-fuel mixture supply means to the cylinder associated therewith; and

vacuum pulse balancing means, comprising:

a plurality of passages disposed downstream of each said separate air-fuel mixture supply means and placing each said cylinder in fluid communication with the air-fuel mixture supply means associated with one of the other cylinders; and

one-way valve means provided in each said passage for providing transfer of the vacuum pulses from said cylinders through said plurality of passages, so that the vacuum pulse from a first one of said cylinders is transferred to the air-fuel supply means associated with a second one of said cylinders so as to draw air-fuel mixture therefrom when a vacuum pulse is not being supplied by said first one of said cylinders.



4,898,128

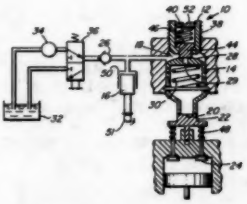
ANTI-LASH ADJUSTER

Vincent A. Meneely, 9837 McKinnon Crescent R.R. No. 10, Langley, B.C., Canada V3A 6X5

Filed Apr. 7, 1988, Ser. No. 179,034

Int. Cl.[4] F02D *9/06*

U.S. Cl. 123—90.12 **6 Claims**



1. A compression relief engine brake for internal-combustion engines, comprising:

an engine having an engine oil pump, exhaust valves, and means for actuating the exhaust valves;

a fluid cavity for accepting engine oil under normal pressure to the fluid cavity;

a slave piston having a predetermined surface area exposed to the fluid cavity, mounted for reciprocating motion within the fluid cavity, wherein the slave piston has a retracted position defining a maximum clearance between one end of the slave piston and the exhaust valve actuating mechanism and an extended position wherein the clearance between the end of the slave piston and the exhaust valve actuating mechanism, is reduced;

means for biasing the slave piston to the retracted position under a predetermined retracting force;

means for applying to the slave piston over a limited distance a net force exclusive of the retracting force and oil pressure which biases the slave piston towards the extended position and does not exceed the retracting force, wherein the resultant force due to the force imposed by oil pressure within the fluid cavity acting on the predetermined surface area of the slave piston and the net force exceeds the predetermined retracting force so that the slave piston is biased to the extended position over the limited distance through which the net force acts;

means for temporarily trapping the oil in the fluid cavity so that displacement of the slave piston in the direction of the extended position is maintained due to the incompressibility of the temporarily trapped oil; and

means for eliminating movement of the slave piston beyond said limited distance through which the supplemental force acts.

4,898,129

VALVE CONTROL OF INTERNAL COMBUSTION ENGINES BY MEANS OF A CAM-DRIVEN ROTARY PISTON PUMP

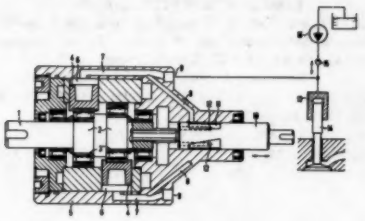
Ewald Junghans, Bergisch Gladbach, and Gabriel Tittizer, Roesrath, both of Fed. Rep. of Germany, assignors to Interatom GmbH, Bergisch Gladbach, Fed. Rep. of Germany

Filed Aug. 26, 1988, Ser. No. 237,227

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1987, 3728511

Int. Cl.[4] F01L *9/02*; F04B *1/06*

U.S. Cl. 123—90.13 **8 Claims**



1. Rotary piston pump assembly, comprising a rotary piston pump having a pump housing and an interior, first outlets for leading fluid out of the interior of said pump, second outlets for leading fluid out of said pump housing, a closed loop of fluid passageways completely disposed within said housing for returning fluid into the interior of said pump through said first outlets, and means for closing said first outlets during a portion of the rotation of said pump.

4,898,130

VALVE MECHANISMS

Bryan N. V. Parsons, Stoney Stanton, United Kingdom, assignor to Jaguar Cars Limited, United Kingdom

Continuation of Ser. No. 252,168, Sep. 30, 1988, abandoned. This application May 5, 1989, Ser. No. 347,740

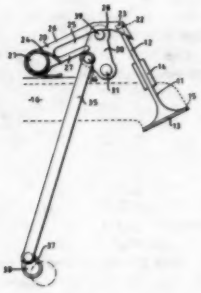
Claims priority, application United Kingdom, Oct. 3, 1987, 8723256

Int. Cl.[4] F01L *1/30*

U.S. Cl. 123—90.16 **21 Claims**

1. A valve mechanism comprising; a valve having a valve stem which is located for axial movement in a valve guide and a valve head adapted at one extreme of movement of the valve to locate against and close a valve seat; a valve lever pivotally mounted at one end and attached adjacent the other end to the end of the valve stem remote from the valve head; said valve lever defining a track; a drive pin permanently engaging said track and drive means to drive said drive pin in oscillatory manner; said track having a first portion which, when the valve is closed, is engaged by the drive pin and coincides with

the path of the drive pin and a second portion which diverges from the path of the drive pin, so that engagement of the



second portion by the drive pin will cause the valve lever to move to positively open and close the valve.

4,898,131

VALVE ACTUATING MECHANISM FOR INTERNAL COMBUSTION MECHANISM

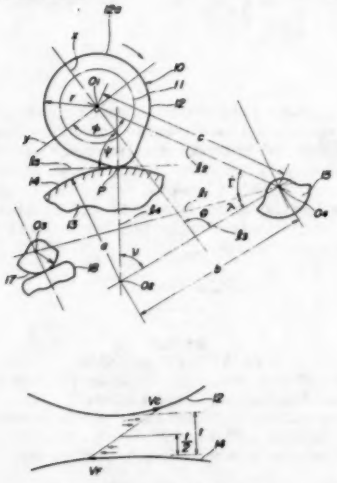
Makoto Sanada; Hiroshi Yamashita; Shinichiro Izawa, and Toshikazu Hamamoto, all of Wako, Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Mar. 3, 1989, Ser. No. 319,113

Claims priority, application Japan, Mar. 18, 1988, 63-65319; Mar. 18, 1988, 63-65325

Int. Cl.[4] F01L *1/08, 1/18*

U.S. Cl. 123—90.44 **3 Claims**



1. In a valve actuating mechanism for an internal combustion engine having at least one intake valve and at least one exhaust valve, including a rotatable cam having a camming surface, and a rocker arm having a cam slipper surface disposed in slidable contact with said camming surface, wherein said intake valve or said exhaust valve is opened and closed by rocking motion of said rocker arm caused by rotation of said rotatable cam,

the improvement wherein said rotatable cam and said rocker arm have dimensions, shapes, and relative positions so designed as to satisfy a condition of $V_C+V_F>0$ irrespective of the angles assumed by said rotatable cam, where V_C represents velocity of movement of a contact point on said camming surface of said rotatable cam at which said camming surface slides on said cam slipper surface, and V_F represents velocity of movement of the contact point on said cam slipper surface at which said cam slipper surface slides on said camming surface.

4,898,132

ENGINE STARTING APPARATUS FOR MARINE PROPULSION ENGINE

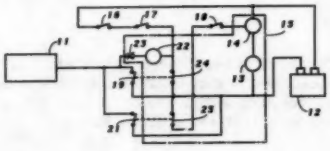
Isao Kanno, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Mar. 11, 1988, Ser. No. 167,307

Claims priority, application Japan, Mar. 13, 1987, 62-57982; Dec. 28, 1987, 62-333466

Int. Cl.[4] F02N *11/08*

U.S. Cl. 123—179 B **11 Claims**



1. In a starting system for an engine having an operator controlled kill switch selectively moveable between an opened position for permitting normal running of said engine and a closed position for disabling the running of the engine and a starting system for starting of the engine, means for providing a warning if the starting system is energized when the kill switch is closed.

4,898,133

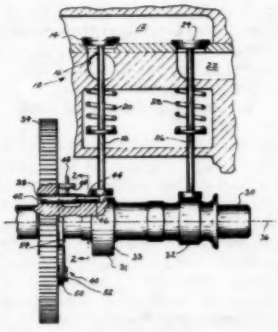
AUTOMATIC COMPRESSION RELEASE APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Mark S. Bader, Sheboygan Falls, Wis., assignor to Kohler Co., Kohler, Wis.

Filed Dec. 7, 1988, Ser. No. 280,792

Int. Cl.[4] F01L *13/08*

U.S. Cl. 123—182 **14 Claims**



1. In an internal combustion engine having an exhaust valve, an exhaust valve lifter, a cam shaft with a cam surface which engages the valve lifter to open the valve at a first angular position of the cam shaft, and a mechanism for opening the valve at a second angular position of the cam shaft, the improvement in the mechanism comprising:

a cam pin located adjacent to the cam surface in a manner in

which said cam pin can rotate on its longitudinal axis, and having a portion eccentric to the longitudinal axis which portion extends above the cam surface to engage the valve lifter and open the valve in a first rotational position and which portion in a second rotational position does not engage the valve lifter in a manner which opens the valve;

a drive pin attached to said cam pin and extending therefrom;

means, engaging said drive pin, for rotating said cam pin in response to engine speed; and

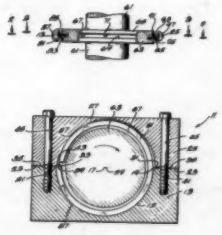
means against which said drive pin abuts when said cam pin is in the first or second rotational positions.

4,898,134

CRANKCASE SEAL ARRANGEMENT FOR TWO CYCLE ENGINE

Paul W. Breckenfeld, Winthrop Harbor, and George L. Broughton, Zion, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Feb. 27, 1989, Ser. No. 316,154
Int. Cl.[4] F16J *15/32*; F16F *15/00*
U.S. Cl. 123—195 R **8 Claims**



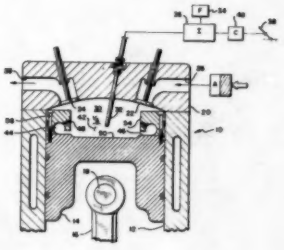
1. An internal combustion engine comprising an engine block comprising a first crankcase-defining member including a first semi-cylindrical surface extending about a first center, and also including a first shoulder extending from said first semi-cylindrical surface, a second crankcase-defining member fixedly connected to said first crankcase defining member and including a second semi-cylindrical surface located in generally co-planar facing relation to said first semi-cylindrical surface, and extending about a second center located in spaced relation to said first center, and also including a second shoulder extending from said second semi-cylindrical surface, a crankshaft supported by said engine block and including a crankcase-defining disc including a cylindrical surface in spaced and generally co-planar facing relation to said first and second semi-cylindrical surfaces and including therein an annular groove, a first seal member located in said annular groove and having an outer surface in sealing engagement with said semi-cylindrical surface of one of said first and second crankcase-defining members and an end surface engaging said shoulder on said other of said first and second crankcase-defining members, and a second seal member located in said annular groove and in sealing engagement with said first sealing member, and having an outer surface in sealing engagement with said semi-cylindrical surface of said other of said first and second crankcase-defining members, and an end surface engaging said shoulder on said one of said first and second crankcase-defining members.

4,898,135

PISTON AND PROCESS FOR ACHIEVING CONTROLLED IGNITION AND COMBUSTION OF HYDROCARBON FUELS IN INTERNAL COMBUSTION ENGINES BY GENERATION AND MANAGEMENT OF FUEL RADICAL SPECIES

Charles C. Failla, Annapolis; Andrew A. Pouring, Edgewater; Bruce Rankin, Annapolis, all of Md.; Carlo L. di Priolo, Milan, Italy; William McCowan, Grasonville, and Dennis Gosewisch, Severna Park, both of Md., assignors to Sonex Research, Inc., Annapolis, Md.

Filed Feb. 16, 1989, Ser. No. 311,289
Int. Cl.[4] F02F *3/28*
U.S. Cl. 123—263 **17 Claims**



1. In a piston for a reciprocating piston internal combustion engine in which a combustion cycle is carried out in a variable volume combustion chamber defined by the piston reciprocating in a close ended cylinder into which a fuel and air charge is periodically supplied, and which cycle includes intake, compression, combustion, expansion and exhaust portions, and wherein the piston crown is recessed and contains the majority of the charge when the combustion chamber is at minimum volume, the improvement comprising:

said piston including a generally toroidal shaped reaction chamber disposed in the piston crown area adjacent the periphery of the recess and extending at least part way around the recess periphery, and a continuous slot orifice providing communication between the recess and the reaction chamber, said reaction chamber and slot orifice being shaped and dimensioned such that during the compression part of each combustion cycle, a portion of the charge is admitted tangentially into the reaction chamber through the slot orifice with the flow of the gas portion of the charge being choked substantially during the entire compression event; the fluid admitted to the reaction chamber is radially vortically swirled in intimate contact with the sidewalls of the reaction chamber so as to effect heat transfer to the admitted charge and its partial oxidation reaction to create radical species of the fuel; any flame front approaching the reaction chamber from the combustion chamber is quenched; and outward flow of compressed gas with radicals from the reaction chamber into the combustion chamber during each combustion cycle through the slot orifice is choked during at least the expansion and exhaust portions of each combustion cycle; and so that radicals of the fuel are produced and retained temporarily in the reaction chamber during the combustion, expansion and exhaust portions of a combustion cycle and are discharged into the piston recess following the conclusion of said exhaust portion at least in advance of the compression portion of the next succeeding combustion cycle in sufficient quantity to condition the next succeeding charge in the combustion chamber for preselected ignition and combustion characteristics.

4,898,136

MIXTURE-COMPRESSING INTERNAL-COMBUSTION ENGINE WITH A MAIN COMBUSTION CHAMBER AND AN AUXILIARY COMBUSTION CHAMBER

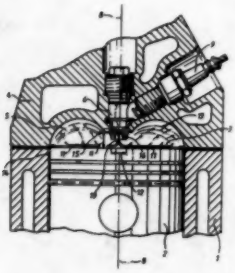
Wolfgang Lutz, Stuttgart, and Robert Happel, Waiblingen, both of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Fed. Rep. of Germany

Filed Mar. 8, 1989, Ser. No. 320,523

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1988, 3807841

Int. Cl.[4] F02B *17/00*

U.S. Cl. 123—269 **14 Claims**



1. Mixture-compressing spark-ignition internal-combustion engine with a cylinder head, which has a depression serving as a main combustion chamber and an auxiliary combustion chamber provided with a spark plug and connected to the main combustion chamber by an overflow bore, through which a part of the fuel/air mixture from the main combustion chamber is compressed by a piston and, after ignition has taken place, leaves at high pressure and velocity as an ignition jet with a jet direction aiming at a surface region of the piston crown, wherein the overflow bore is aligned concentrically with respect to the longitudinal center axis of the cylinder and the surface region of the piston crown is designed as a level impact area lying opposite the overflow bore and running orthogonally with respect to the jet direction of the ignition jet.

4,898,137

CONTROL DEVICE FOR VEHICLE

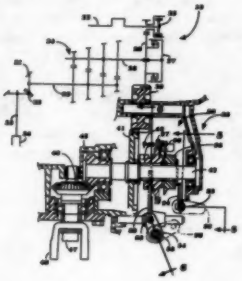
Minoru Fujita, Iwata, and Hirotaka Shibata, Hamamatsu, both of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Division of Ser. No. 846,565, Mar. 31, 1986, Pat. No. 4,805,572. This application Jan. 13, 1989, Ser. No. 297,479

Int. Cl.[4] F02D *9/08, 29/00, 31/00*

U.S. Cl. 123—352 **20 Claims**

9. In an internal combustion engine having a first speed controlling element for controlling the speed of said engine, a second speed controlling element for controlling the speed of said engine, a manual operator for said first speed controlling element for manual engine speed control, an automatic operator for said second speed controlling element for automatic engine speed control, means for selectively controlling the engine speed from either said manual operator or said automatic operator, and means for precluding engine speed control



by the other of said operators upon selection of engine speed control by one of said operators.

4,898,138

ENGINE CONTROL APPARATUS

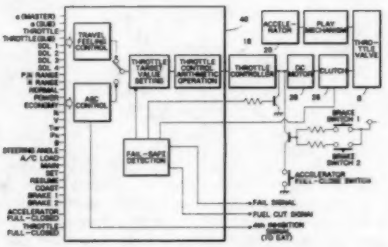
Eiji Nishimura; Kazutoshi Nobumoto, both of Hiroshima; Toshihiro Matsuoka; Toshiaki Tsuyama, both of Higashihiroshima, and Kaoru Sotoyama, Hatsukaichi, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Oct. 24, 1988, Ser. No. 261,971

Claims priority, application Japan, Oct. 26, 1987, 62-268307

Int. Cl.[4] F02D *11/10*

U.S. Cl. 123—399 **14 Claims**



1. An engine control apparatus comprising:

operation amount detection means for detecting an operation amount of an accelerator;

engine output adjusting means for adjusting an engine output;

arithmetic means for receiving the output from said operation amount detection means and calculating a control amount corresponding to the output operation amount of the accelerator in accordance with a predetermined characteristic, said control amount being one for controlling said engine output adjusting means;

drive means for receiving the output from said arithmetic means and driving said engine output adjusting means in accordance with said control amount calculated by said arithmetic means;

return detection means for detecting a return state of said accelerator; and

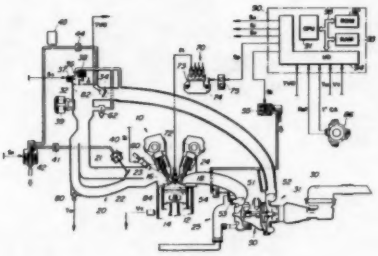
control means for, when said return detection means detects the return state of said accelerator, controlling said arithmetic means to output said control amount in accordance with a characteristic with which the engine output is decreased below that according to said predetermined characteristic.

4,898,139

ENGINE CONTROL APPARATUS

Tooru Kitayama, and Toshiya Ohtani, both of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 8, 1988, Ser. No. 241,876
Claims priority, application Japan, Sep. 9, 1987, 62-227227
Int. Cl.[4] F02D *41/04*; F02P *5/14*
U.S. Cl. 123—425 **4 Claims**



1. An apparatus for controlling an internal combusiton engine of the spark ignition type including spark-timing control means for controlling the timing of sparks supplied to the engine, comprising:

sensor means for sensing a condition of the engine;

a knock sensor for sensing engine knock;

a control unit including memory means having a first table describing a desired relationship between the sensed engine condition and the spark-timing control means for the engine being operating on first fuel having a first octane number and a second table describing a desired relationship between the sensed engine condition and the spark-timing control means for the engine being operating on second fuel having a second octane number greater than the first octane number, the control unit including means for providing a control signal having a first and second level, and means for calculating a first value corresponding to a setting of the spark-timing control means repetitively at uniform intervals from the first table in response to the first level of the control signal and from the second table in response to the second level of the control signal;

an electrical circuit coupled between the control unit and the spark-timing control means for converting the calculated first value into a setting of the spark-timing control means,;

the control unit including means for performing advance control to advance the spark timing at a first predetermined rate when the sensed engine condition is within a specified range in the presence of the first level of the control signal, and means for changing the control signal from the first level to the second level when the spark timing is advanced over a first reference value during the advance control;

the control unit including means for performing knock control to retard the spark timing at a second predetermined rate in response to the sensed engine knock in the presence of the second level of the control signal, means for changing the control signal from the second level to the first level when the spark timing is retarded over a second reference value less than the first reference value during the knock control;

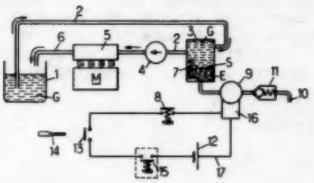
the control unit including means for storing a maximum value βmax to which the spark timing is advanced at maximum during the advance control, means for advancing the spark timing by the stored maximum value βmax before the spark timing is advanced at the first predetermined rate during the following advance control, and means for clearing the maximum value βmax to zero when the spark timing is advanced over the first reference value during the advance control.

4,898,140

DEVICES FOR ELIMINATING WATER FROM DIESEL OIL SUPPLYING A DIESEL ENGINE

Jean Pages, Epinay sur Seine, France, assignor to Labinal, Montigny le Bretonneux, France

Filed Apr. 10, 1989, Ser. No. 335,502
Claims priority, application France, Apr. 11, 1988, 88 04760
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—510 **4 Claims**



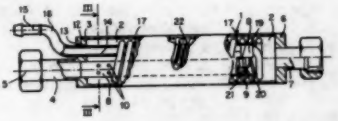
1. Device for eliminating water present in diesel oil supplying a diesel engine of a vehicle, comprising a water separating member mounted in the diesel oil supply circuit of the engine, a container for the water separated from the diesel oil, means for detecting the passage of a predetermined warning threshold by the volume of separated water collected in said container, an electric drainage pump whose inlet is connected to the container and the outlet to an evacuation pipe equipped with a non-return valve and an electrical energizing circuit for this pump comprising an electric switch associated with the above detection means, which are arranged so as to close it automatically when the warning threshold is reached or passed by the volume of water collected in the container, characterized in that said electrical energizing circuit for the pump comprises a second electrical switch mounted in series with the first, arranged so as to be closed on the energization of the electrical circuit of the vehicle, and associated with means adapted to neutralize automatically its closure at the latest at the moment of starting up of the engine.

4,898,141

FUEL COOLING DEVICE

Christian Fiedler, Gernsbach, Fed. Rep. of Germany, assignor to Aeroquip GmbH, Baden-Baden, Fed. Rep. of Germany

PCT No. PCT/EP87/00550, § 371 Date Apr. 8, 1988, § 102(e) Date Apr. 8, 1988, PCT Pub. No. WO88/02442, PCT Pub. Date Apr. 7, 1988
PCT Filed Sep. 28, 1987, Ser. No. 221,782
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1986, 3633951
Int. Cl.[4] F02M *31/00, 31/20*
U.S. Cl. 123—541 **9 Claims**



1. A fuel cooling device comprising: a cylindrical housing; a refrigerant tube for carrying a refrigerant mounted in said housing; a spirally wound fuel tube surrounding said refrigerant tube; said refrigerant tube having connecting ends for the refrigerant and for fuel; said refrigerant tube having openings

for penetration of refrigerant into the interior of said housing; said spirally wound fuel tube comprising a continuous tube assembly located substantially in the interior of said housing; connecting ends on said tube assembly, said tube assembly exiting from said housing through said connecting ends; and adjustable throttle means located in an open end of said refrigerant tube.

4,898,142

COMBUSTION ENGINE WITH FUEL INJECTION SYSTEM, AND A SPRAY VALVE FOR SUCH AN ENGINE

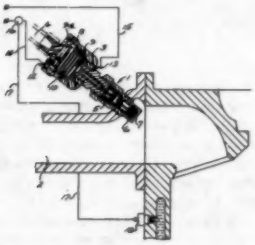
Guus Van Wechem, Kattenhaarsweg; Gerrit Beunk, Lisztstraat; Frits Van Den Elst, Borserbroeksestraat, and Arie Van Der Ploeg, Larixlaan, all of Netherlands, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 28, 1987, Ser. No. 55,481

Claims priority, application Netherlands, May 29, 1986, 8601384

Int. Cl.[4] F02M *31/00, 31/12*

U.S. Cl. 123—557 **4 Claims**



1. A combustion engine with a fuel system, said engine having at least one cylinder with an air inlet passage, into which passage opens a fuel spray valve which is connected to a fuel pipe with a pump, while disposed in a selected part of the fuel system is a fuel heating element with which the infed fuel can come into direct contact, characterized in that the fuel system comprises a fuel injection system having a fuel spray valve which is connected to the fuel pipe and the fuel heating element is provided in the form of a thermistor of material with a positive temperature coefficient associated with the fuel spray valve, said thermistor being connected to an electrical supply and discharge cable, a holder being disposed on the fuel spray valve and having therein the thermistor in the form of a PTC tablet which is connected to a heat sink for transfer of heat to the fuel, said heat sink being designed as a metal box to have good heat-conducting properties and low mass with at least one fuel passage for heat transfer from the box to fuel flowing in the passage.

4,898,143

EXHAUST GAS RECIRCULATION CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES

Sachito Fujimoto, and Takuya Sugino, both of Wako, Japan, assignors to Honda Giken Kogyo K. K. (Honda Motor Co., Ltd. in English), Tokyo, Japan

Filed Mar. 1, 1989, Ser. No. 317,824

Claims priority, application Japan, Mar. 22, 1988, 63-67563

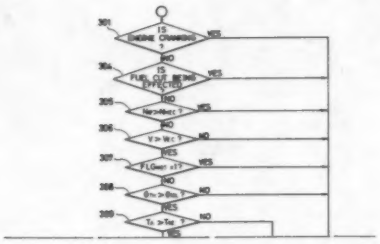
Int. Cl.[4] F02M *25/06*

U.S. Cl. 123—571 **7 Claims**

1. A method of controlling exhaust gas recirculation in an internal combustion engine having an exhaust passage, an intake passage, an exhaust gas recirculating passage extending between said exhaust passage and said intake passage, and an exhaust gas recirculating valve arranged across said exhaust gas recirculating passage, wherein the opening of said exhaust gas recirculating valve is controlled in response to operating conditions of said engine, the method comprising the steps of:

(1) detecting an amount of load on said engine;

(2) detecting a value of a temperature of said engine;



(3) setting a predetermined value of load on said engine in response to the detected value of the temperature of said engine; and

(4) inhibiting the exhaust gas recirculation when the detected amount of load of said engine exceeds said predetermined value.

4,898,144

INTAKE SYSTEM FOR INTERNAL COMBUSTION ENGINE

Manabu Kobayashi, Iwata; Kazutoshi Suzuki, Fukuroi, and Takeo Kondo, Iwata, all of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Continuation of Ser. No. 845,576, Mar. 28, 1986, abandoned. This application Apr. 3, 1989, Ser. No. 333,717

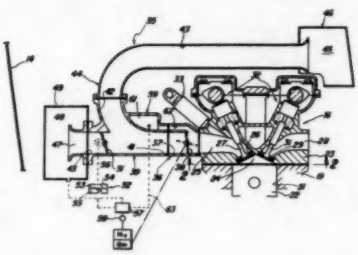
Claims priority, application Japan, Mar. 30, 1985, 60-67164

Int. Cl.[4] F02M *35/10*

U.S. Cl. 123—52 M **47 Claims**

1. An intake system for an internal combustion engine having a variable volume chamber an inlet port serving said chamber, a first intake passage having an air inlet at one end and an outlet end serving said inlet port, a second intake passage having an inlet end and an outlet end serving said inlet port, said second intake passage outlet end communicating with said first intake passage between its air inlet end and the outlet end of said first intake passage, said second intake passage having a substantially different length than said first intake passage, a first plenum chamber communicating with said inlet end of said first intake passage for serving first intake passage, means for supplying atmospheric air to said first plenum chamber, a second plenum chamber spaced from said first plenum cham-

ber and serving said inlet end of said second intake passage, means for supplying atmospheric air to said second plenum



chamber, and a throttle valve for selectively controlling a flow through only one of said intake passages.

4,898,145

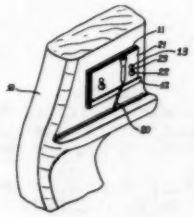
ARROW REST AND HOLDER

Miroslav A. Simo, 370 N. Delaplaine, Riverside, Ill. 60546

Filed Aug. 1, 1983, Ser. No. 518,957

Int. Cl.[4] F41D 9/00

U.S. Cl. 124—41 A **5 Claims**



1. An arrow rest holder comprising; a generally flat mounting plate, said mounting plate having securement means for rigid securement of one side adjacent to a bow and the other side of said mounting plate having a holding and positioning means detachably holding and positioning an arrow rest, said holding and positioning means comprising at least one extension holding means comprising a shaft portion and a larger head portion extending from said other side of said mounting plate adapted to securely engage an arrow rest mounting body.

4,898,146

HEATING APPLIANCE

Jan A. Stapensèa, Gasteren, Netherlands, assignor to Fasto B.V., Buinen, Netherlands

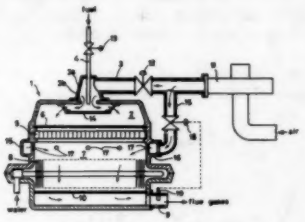
Filed Dec. 6, 1988, Ser. No. 280,383

Claims priority, application Netherlands, Dec. 10, 1987, 8702987

Int. Cl.[4] F24H 3/00

U.S. Cl. 126—116 A **12 Claims**

1. A heating appliance, comprising a burner of the type having a full premixing and forced draught, and having a mixing chamber to which an air supply line and a fuel supply are connected, said mixing chamber having a burner plate which is provided with apertures and which adjoins a combustion chamber in which a heat exchanger is disposed some distance from the burner plate and is passed through by a medium to be heated, a flue being connected to said combustion chamber, and means in the heating appliance for varying the effective heat transfer of the flue gases to the heat ex-



changer to prevent cooling of the flue gases below their dew point under low load conditions of the heating appliance.

4,898,147

DOMESTIC OVEN OBSERVATION WINDOW HAVING A LOW TEMPERATURE EXTERNAL SURFACE

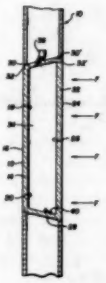
Fabrizio Doni, and Bruno Ferrario, both of Milan, Italy, assignors to SAES Getters SpA, Milan, Italy

Filed Nov. 2, 1988, Ser. No. 266,151

Claims priority, application Italy, Nov. 24, 1987, 22735

Int. Cl.[4] F23M 7/00

U.S. Cl. 126—200 **14 Claims**



1. An observation window comprising:

A. an outer glass sheet having an outer facing surface and an inner facing surface, the inner facing surface covered by a layer of material reflecting infra-red radiation and transmitting visible light and;

B. an inner glass sheet having an outer facing surface and an inner facing surface and;

C. a distancing wall the edges of which are peripherally attached to both the outer glass sheet and the inner glass sheet thus defining an encloseed volume and;

D. a glass pumping tubulation attached to the distancing wall and;

E. a rare-gas contained within the enclosed volume at a pressure of between 10 and 1000 mbar at 25° C.

14. An oven comprising

I. An enclosure; and

II. A door providing access to the enclosure; and

III. Means for heating the enclosure; and

IV. An observation window within the door; said window comprising:

A. an outer glass sheet having an outer facing surface and an inner facing surface, the inner facing surface covered by a layer of material reflecting infra-red radiation and transmitting visible light and;

B. an inner glass sheet having an outer facing surface and an inner facing surface and;

C. a distancing wall the edges of which are peripherally attached to both the outer glass sheet and the inner glass sheet thus defining an enclosed volume and;

D. a glass pumping tubulation attached to the distancing wall and;

E. a rare-gas contained within the enclosed volume at a pressure of between 10 and 1000 mbar at 25° C.

4,898,148

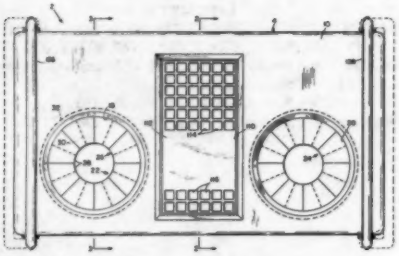
VERSATILE HEATER/COOLER

Charles L. Urso, 215 Newton St., Waltham, Mass.

Filed Jun. 28, 1988, Ser. No. 212,505

Int. Cl.[4] A61F *7/00*

U.S. Cl. 126—204 **32 Claims**



1. A portable temperature conditioning apparatus comprising:

a container having a plurality of walls defining a hollow interior, the walls having insulating means for inhibiting the transfer of heat through the walls, the walls including a lid having a longitudinal axis and a portion having an edge defining a limb port of a size suitable for insertion of a user's limb through the port and into the interior of the container, the edge being substantially curved in order to comfortably surround the limb;

means for producing a temperature condition within the container;

a pair of U-shaped carrying handles, each handle having a pair of legs wherein each leg is pivotally connected to the container such that each handle is movable between an erect position and a lower position; and

means for retaining the handles in an erect position so that together the handles can support broad surfaced items above the container to aid the user.

4,898,149

CORD-CONNECTED HOOD-BACKSPLASH

Martin B. Cohn, 25 Oxford Pl., Rockville Centre, N.Y. 11570

Filed Jun. 12, 1989, Ser. No. 364,972

Int. Cl.[4] F24C *15/20*

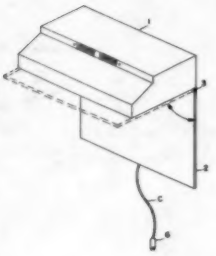
U.S. Cl. 126—299 R **1 Claim**

1. A cord connected ductless range-hood, fan and backsplash comprising:

a bracket adapter to be mounted on a wall,

a range hood/backsplash adapted to be mounted on the bracket so that the hood is horizontal and the backsplash is hinged to the hood and vertical,

the hood being adapted to mount a light and a fan, internal wiring for the light and for passing from the hood through



the bracket, and a line cord connected to the internal wiring exiting from behind the bottom of the backsplash.

4,898,150

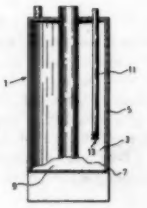
PRESSURE BALANCING WATER HEATER DIP TUBE TURBULATOR ATTACHMENT

Brian Lewis, Guelph, Canada, assignor to GSW Inc., Toronto, Canada

Filed Mar. 10, 1989, Ser. No. 321,876

Int. Cl.[4] F24H *1/00*

U.S. Cl. 126—361 **6 Claims**



1. A water heater comprising a tank having a bottom wall and a plastic water feed dip tube extending along a vertical axis downwardly into said tank towards and having a lower end terminating near said bottom wall, said lower end of said dip tube comprising a turbulator including an end plate with a flat upper surface at right angles to said vertical axis and a plurality of water flow openings immediately above said flat upper surface of said end plate, said water flow openings being positioned symmetrically at all sides around said dip tube such that water fed into said tank through said dip tube impinges on said flat upper surface of said end plate and is redirected as a balanced flow sideways in all directions out of said water flow openings to cause a swirling effect of the redirected water maintained near the bottom end of the tank and agitating any sediment settled thereon.

4,898,151

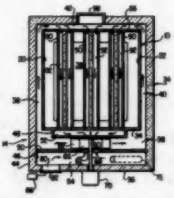
HIGH HEATING EFFICIENCY DEEP FAT COOKING FRYPOT

Clement J. Luebke, Burlington, Vt.; Frank A. Slade, Mountain Top, Pa.; Gerald W. Sank, Pasadena, Md.; James T. Grob; George M. Price, both of Shreveport, La., and Elbert M. Hubbard, Dallas, Tex., assignors to The Frymaster Corporation, Shreveport, La.

Continuation-in-part of Ser. No. 550,995, Nov. 14, 1983, Pat. No. 4,751,915, which is a continuation of Ser. No. 264,370, May 18, 1981, abandoned. This application Jun. 20, 1988, Ser. No. 209,280

Int. Cl.[4] A47J *27/00*

U.S. Cl. 126—391 **9 Claims**



1. Deep fat cooking frypot apparatus comprising:

a frypot adapted to receive a quantity of cooking fluid;

wall means carried by said frypot for defining a recirculating flow passage thermally communicating with an oil-receiving interior portion of said frypot;

means for generating heated gas; and

fan means having an inlet and being operable to sequentially;

draw a first portion of the generated gas into said inlet,

discharge said first generated gas portion into and through said flow passage to transfer heat from said first generated gas portion to the cooking fluid,

return said first generated gas portion to said inlet at a reduced temperature,

mix the returned first generated gas portion with a second generated gas portion being initially drawn into said inlet to form from said first and second generated gas portions a gas mixture having a lower temperature than that of said second generated gas portion, and

discharge said gas mixture into and through said flow passage, and then back to said inlet.

4,898,152

DUAL SEQUENCE SOLAR WATER HEATER

Karl H. Kahl, 8 Brian Rd., Chelmsford, Mass. 01824

Continuation of Ser. No. 683,210, Dec. 18, 1984, abandoned. This application Jul. 24, 1987, Ser. No. 77,601

Int. Cl.[4] F24J *3/02*

U.S. Cl. 126—422 **10 Claims**

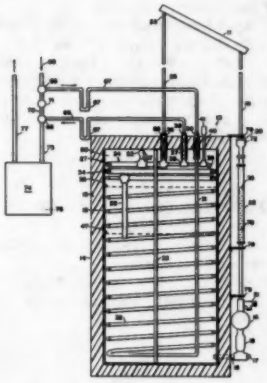
1. In a heat exchanger means for receiving the water for transferring to water, being conveyed from a water source to utilization means, heat from a transfer liquid heated in solar panel means, said heat exchanger means comprising:

A. closed tank means for storing the transfer liquid in lower and middle volumes thereof and including first and second ports for the transfer liquid, a third port for connection to the water source and a fourth port for connection to the utilization means;

B. circulating means for circulating the transfer liquid from said first port through the solar panel means to said second port;

C. multi-turn heat exchange coil means coextensive with said lower and middle tank volumes and having an outlet means in said upper tank volume and inlet means connected to said third port for receiving water from the water source to be heated by the transfer liquid in the tank;

D. multi-turn counterflow heat exchanger means with inner and outer liquid passage means located in the upper tank volume above the heat exchanger liquid level, said inner passage means being connected between said heat exchange coil outlet means and said fourth port thereby to complete a closed path between the water source and the utilization means and said outer passage means being connected to said second port to receive heated transfer liquid from the solar panels;



E. discharge means extending from said outer passage means to said lower tank volume for conveying all transfer liquid from said outer passage means to a point below the transfer liquid in said tank thereby to complete a closed-loop transfer liquid path;

F. vacuum breaker means connected to said outer passage means in said upper tank volume for breaking any vacuum in said closed transfer liquid path with air from said upper tank volume,

G. vent means for metering the transfer of air between said upper tank volume and the exterior of said tank.

4,898,153

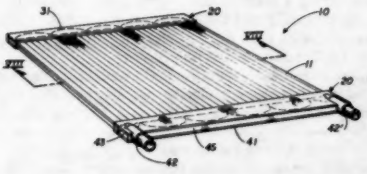
SOLAR ENERGY PANEL

Daniel A. Sherwood, 3905 Orangewood Dr., Fair Oaks, Calif. 95628

Filed Apr. 3, 1989, Ser. No. 332,158

Int. Cl.[4] F24J *2/24*

U.S. Cl. 126—448 **13 Claims**



1. A solar panel comprising a main body portion and a pair of caps in a mating arrangement at the opposite ends of the main body portion,

wherein the main body portion comprises an integrated sheet formed from a pair of spaced skins separated by a series of uniformly spaced parallel ribs running the full length of the two skins, each pair of spaced ribs defining a channel for the flow of fluid, said body portion being

disposed within said caps, and having a series of adjacent channels,

each cap comprising (a) a baffle member having a front wall an upper and a lower surface, and a series of adjacent arcuate recesses therein each of which recesses extends inwardly from the front wall thereof, and each of which recesses communicates with a defined plurality of said channels, the baffle member having a thickness equal to the thickness of the main body portion; and (b) a pair of skins overlaid on each of the upper and lower surfaces of the baffle member and extending inwardly beyond the recesses to form a slot transverse to said channels for the receipt of the main body portion,

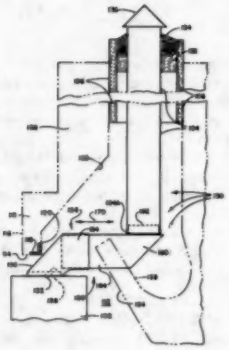
both of said caps having from zero to two ports therein one port being for the introduction and one port being for the removal of fluid from said panel, the total number of ports being two; each of said ports being in fluid communication with a number of channels of the main body portion, said number being equal to $\frac{1}{4}$ of the number of channels in fluid communication with each recess.

4,898,154

ADJUSTABLE FITTING FOR FIREPLACE INSERT FLUE CONNECTION

David E. Richison, Kettering, Ohio, assignor to Richison Industries Incorporated, Kettering, Ohio

Filed Oct. 3, 1988, Ser. No. 252,121
Int. Cl.[4] F24B *7/00*; F23J *13/04*
U.S. Cl. 126—500 **7 Claims**



1. A horizontally adjustable fitting for connecting a wood burning insert for a masonry fireplace to a vent pipe positioned within the flue liner of the fireplace chimney, said masonry fireplace having a firebox recess including a rear wall which converges upwardly and forwardly toward a front wall, said horizontally adjustable fitting extending through a central portion of said rear wall and comprising;

an insert connector having first and second legs which are substantially perpendicular to one another, said first leg being vertically oriented when said horizontally adjustable fitting is in use and sized to engage a flue gas outlet of said wood burning insert; and

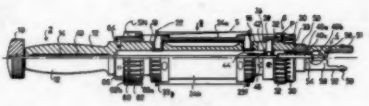
a vent pipe connector having first and second legs which are substantially perpendicular to one another, said first leg being vertically oriented when said horizontally adjustable fitting is in use and sized to engage a lowermost end of said vent pipe, the second legs of said insert connector and said vent pipe connector being formed such that they can be telescopically interfitted to one another to adjust the spacing between the first legs of said connectors to adapt said horizontally adjustable fitting to a large variety of inserts and fireplaces.

4,898,155

SUTURING IMPLEMENT PARTICULARLY USEFUL IN SURGICAL OPERATIONS FOR THE ATTACHMENT OF A PROSTHETIC VALVE

Yoel Ovil, Ramat Hasharon, and Morris Levy, Tel-Aviv, both of Israel, assignors to Galil (Naharia) Advanced Technologies Ltd., Ramat-Gan, Israel

Filed Sep. 25, 1985, Ser. No. 779,980
Claims priority, application Israel, Sep. 26, 1984, 73081
Int. Cl.[4] A61B *17/04, 17/06*
U.S. Cl. 606—144 **19 Claims**



1. A suturing implement particularly useful in surgical operations for suturing a member, such as a prosthetic valve, to tissue at the suture site by a plurality of sutures each including a needle attached to at least one end thereof, comprising:

a manually grippable handle;

pledget gripping means carried by said handle for gripping a plurality of pledgets each in a position to be pierced by a suture needle;

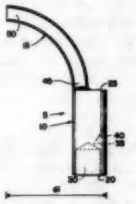
and releasing means carried by said handle for actuating said pledget gripping means to release said pledgets and the sutures applied thereto from said handle.

4,898,156

SUTURE ANCHOR

Roland F. Gatturna, Walpole; James E. Nicholson, Lincoln, and James O'Leary, Medford, all of Mass., assignors to Mitek Surgical Products, Inc., Norwood, Mass.

Filed May 18, 1987, Ser. No. 51,367
Int. Cl.[4] A61F *5/04*; A61B *17/04*; F61B *21/00*
U.S. Cl. 606—72 **23 Claims**



1. A suture anchor for anchoring one end of a suture in a hole formed in a piece of bone, said suture anchor comprising;

(a) a rigid coupling member; and

(b) barb means fixed to an end thereof to said coupling member for firmly engaging a first location on the sidewall of a hole in a piece of bone in which said suture anchor is disposed and for causing said coupling member to pivot in said hole so as to drive at least a portion of said coupling member into firm engagement with at least a second location on said sidewall of said hole so that the combined engagement of said barb means and said at least a portion of said coupling member with the sidewall of said hole substantially prevents said suture anchor from being withdrawn from said hole when an axial force is applied to a suture attached to one of said coupling member or said barb means.

4,898,157

INSTRUMENT FOR HOLDING SURGICAL NEEDLES

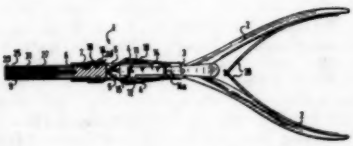
Hossein Mesroghli, Gross-Gerau, and Manfred Boebel, Oetisheim, both of Fed. Rep. of Germany, assignors to Richard Wolf GmbH, Fed. Rep. of Germany

Filed Oct. 3, 1988, Ser. No. 251,750

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1987, 3733194

Int. Cl.[4] A61B *17/04*

U.S. Cl. 606—147 9 Claims



1. An instrument for holding surgical needles, said instrument having a distal end, a proximal end, and a longitudinal axis, the instrument comprising: an elongated member extending along said longitudinal axis, a pair of forceps having forceps jaws at said distal end including a fixed jaw on a distal end of said elongated member, a movable jaw pivotably mounted on said fixed jaw, a push and pull rod being connected to the movable jaw, a handle having a pair of hand grips being pivotably connected to the proximal end of said elongated member and extending obliquely outwardly of the instrument in the proximal direction thereof and being arranged in mirror image symmetry with respect to said longitudinal axis; the hand grips being actuatable by an actuating force exerted thereon transversly of said axis to move both hand grips toward the longitudinal axis to bring the forceps to said closed position with the forceps jaws lying in the direction of said longitudinal axis, connecting means connected to a distal end of said hand grips and a proximal end of said rod for converting the actuating force into a force directed longitudinally to the instrument to shift the rod to actuate the movable jaw, and means for releasably locking said movable jaw in its actuated position.

4,898,158

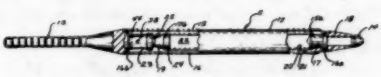
PENILE IMPLANT WITH IMPROVED PRESSURE RELIEF VALVE

Mark D. Daly, Milwaukee; James T. Maerzke, Kenosha; Jeffrey R. Gengler, Milwaukee, and Robert E. Trick, Racine, all of Wis., assignors to Medical Engineering Corporation, Racine, Wis.

Division of Ser. No. 50,746, May 15, 1987, Pat. No. 4,823,779. This application Dec. 12, 1988, Ser. No. 282,817

Int. Cl.[4] A61F *2/26*

U.S. Cl. 128—79 1 Claim



1. In an inflatable self-contained penile implant consisting of a cylindrical member having a pressure chamber, a reservoir for inflating fluid and a pump operatively connected to transfer fluid from the reservoir to the pressure chamber, the improvement which comprises an improved pressure relief valve operatively connected to the pressure chamber, said valve having a cylindrical housing with an inlet with a restricted opening at one end; a passage connecting said inlet to the reservoir; at least one outlet intermediate the length of said passage communicating with the reservoir; a close fitting piston mounted in said passage between the inlet and the outlet, said piston having a piston face; an integral raised annular knife edge seal on said piston face enclosing an area of the face of said piston; and, a precalibrated spring for maintaining said seal seated about said restricted opening, said area of the piston face within the seal being significantly smaller than the total area of the piston face so that once the seal is initially unseated by fluid pressure from its position about the restricted opening a substantially larger force is available to move the piston back to expose the outlet and quickly open the valve and release fluid back to the reservoir.

4,898,159

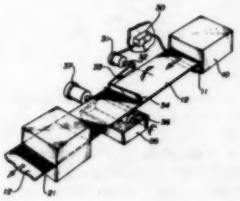
RAVEL-FREE ORTHOPAEDIC CASTING TAPES

George J. Buese, East Brunswick, and Hee K. Yoon, North Brunswick, both of N.J., assignors to Johnson & Johnson Orthopaedics, Inc., New Brunswick, N.J.

Division of Ser. No. 5,491, Jan. 20, 1987, Pat. No. 4,800,872. This application Sep. 9, 1988, Ser. No. 242,381

Int. Cl.[4] A61F *5/04*

U.S. Cl. 128—90 8 Claims



1. A method of forming a ravel resistant orthopedic casting tape comprising applying a soft flexible binder material to a fiberglass substrate, said binder being applied in an amount of from 2.5 to 90 grams per square meter of binder coated area, the binder having a type A hardness of less than 50, drying the binder to form a thin stretchable coating on said substrate, subsequently impregnating the substrate with water reactive hardenable resin, cutting the substrate to definitive lengths to form a length of casting tape and packaging the tape in a water impervious packaging material.

4,898,160

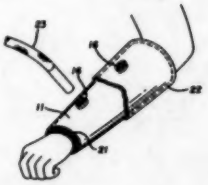
SURGICAL CAST VENTING DEVICE

Merrel Brownlee, Lowellville, Ohio, assignor to Alliance Group Inc., Youngstown, Ohio

Filed Mar. 24, 1989, Ser. No. 328,283

Int. Cl.[4] A61F *5/04*

U.S. Cl. 128—91 R 2 Claims



1. A surgical cast venting device for positioning on a layer of stockingnette on a patient's limb under a cast, said device comprising a flexible base portion, several parallel elongated channels in said base portion arranged in side by side relation in alternating upward and downward face directions, a flexible closure engaging said upward facing channels so as to form air passageways therein, an air supply opening in said closure communicating with said parallel elongated channels, apertures interconnecting said parallel elongated channels said channels having common side walls and said apertures being in

said common side walls, whereby air supplied said opening flows through said parallel elongated channels for delivery thereby to said layer of stockingnette on said patient's limb.

4,898,161

FORCEPS FOR PUSHING APART VERTEBRAE

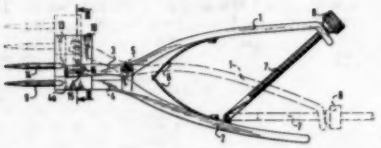
Hans Grundei, Lübeck, Fed. Rep. of Germany, assignor to S+G Implants GmbH, Lubeck, Fed. Rep. of Germany

Filed Nov. 24, 1987, Ser. No. 124,917

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1986, 3641279; Mar. 3, 1987, 3707097

Int. Cl.[4] A61F *5/04*; **B25B** *7/12, 7/04*

U.S. Cl. 606—105 **2 Claims**



1. Forceps for pushing apart adjacent vertebrae comprising a pair of axially parallel pins for insertion into bores in said vertebrae, a linearly sliding element guide system to enable said pins to be moved towards and away from one another while remaining mutually parallel, a pair of jaws on which said pins and said guide system are mounted, a pair of handles to actuate said jaws and effect said movement of the pins, a rod, a lateral arm, a bracket attached to one of said jaws, a first pin carrier attachable via said lateral arm to said bracket, said pin carrier provided with an aperture perpendicular to the extension of one of said pins, said aperture acting as a guide for said rod, said rod coupled at one end to the other of said jaws so as to be movable in an axial direction within said aperture, and coupled at the other end to a second pin carrier, both said pin carriers being replaceably connectable to said respective jaws.

4,898,162

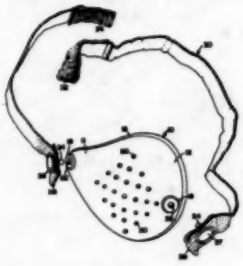
CONVERTIBLE EYESHIELD

Theodore S. Worthrich, Long Beach, Calif., assignor to Surgin Surgical Instrumentation, Inc., Placentia, Calif.

Filed Sep. 22, 1988, Ser. No. 247,841

Int. Cl.[4] A61F *13/00*

U.S. Cl. 128—155 **4 Claims**



1. An eyeshield which can be taped over an eye-socket of a person by a health professional or a patient or alternatively, applied repeatedly without the use of tape by the patient himself, said eyeshield covering an eye and preventing any contact with the eye, thereby protecting the eye following an injury or surgery, comprising:

(a) a low friction, yieldable, light weight, high strength, self-supporting, eyeshield body having a first and a second surface, the first surface being a convex outer surface, the second surface being an inner concave surface, the eyeshield body having rounded edges and an outline fitting against the orbital bone structure of a face in fixed, non-contacting relation over the eye and including a periphery defining a generally circular portion and an extension therefrom;

(b) a pair of socket bosses not greater than one quarter inch in height integral with the convex surface of the eyeshield body adjacent the edge of the extension thereon on a first end and adjacent the edge of the circular portion on a second end, said bosses allowing the eyeshield to be taped onto the face of the person over the eyesocket; and

(c) releasable means for holding the eyeshield body over the eyesocket, said releasable means comprising an elastic band for encircling the head of the person over the eyebrow on one side of a face and under the ear lobe on the other side of the face, the band comprising a pair of sections having first and second interengaging fastening members on the ends opposite the snap fastener end, said interengaging fastening members comprising intercoupling hook and loop sections.

4,898,163

TRANSTRACHEAL AIRWAY AND PLACEMENT DEVICE

Gordon P. George, 1717 N. 1030 West, Orem, Utah 84057

Filed Feb. 27, 1989, Ser. No. 315,538

Int. Cl.[4] A61M *16/00*

U.S. Cl. 128—200.26 **9 Claims**

1. An apparatus for performing transtracheal intubation via the cricothyroid membrane comprising, in combination:

a syringe means comprising at least one hollow barrel with a distal end adapted for attachment of integral apparatus means;

a plunger means slideably disposed within said hollow barrel of said syringe means;

a flexible stylet means slideably disposed within said barrel of said syringe means;

a hollow curvilinear needle means integrally attached to said distal end of said syringe means, said needle means having at its distal end a sharpened edge to serve as a cutting blade; and

a non-metal hollow tube airway means which is slideably disposed over said needle means.

4,898,164

AIR SUPPLYING DEVICE, AND METHOD OF AIR SUPPLY

Iosif Baumberg, 69 Bay 29 St., Brooklyn, N.Y.

Filed Feb. 17, 1989, Ser. No. 311,046

Int. Cl.[4] A61M *16/20, 15/00*; **A62B** *7/00, 7/12*

U.S. Cl. 128—202.18 **9 Claims**

1. An air supply device to be used for ventilation in the vicinity of a subject's face while subject is sleeping on a pillow, comprising:

a plurality of normally inflated valve-chambers arranged to be located under respective sides of a pillow and formed

so that when a subject's head rests on at least one of said valve-chambers, said at least one valve-chamber is deflated while another of said valve-chambers not supporting the subject's head remains inflated;

means for supplying air to said valve-chambers; and

a plurality of passages, at least one passage extending from each of said valve-chambers, each of said passages having an outlet, each outlet being at the opposite side of the

pillow from its associated valve-chamber, and being directed across the pillow towards the subject's face such that when the subject's head rests on at least one of said valve-chambers and the latter is deflated, the air supplied from said supplying means to said valve-chambers exits from at least one of said inflated valve-chambers, through its associated passage to its outlet, thereby directing air toward the face of the subject.

4,898,165

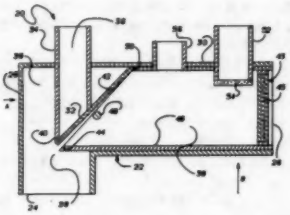
BREATHING APPARATUS

Lyle Warzeka, 2064 11th St., Wyandotte, Mich. 48192

Filed Dec. 8, 1988, Ser. No. 281,847

Int. Cl.[4] A61M *15/00*

U.S. Cl. 128—204.18 **10 Claims**



1. A universal manual resuscitator valve, comprising:

a valve body having a bore therethrough which defines a passage;

an annular valve seat disposed in said bore;

a valve element attached at one portion to said valve body in said bore and adjacent said valve seat such that said valve element seats on said valve seat in a first mode of operation,

said valve element serving to partition said passage into a first portion and a second portion in said first mode of operation;

an exhalation stem disposed in said valve body and defining an exhalation passage, said exhalation stem having a first end which projects into said bore at said first portion of said passage, said first end being beveled and positioned with respect to said valve element such that said valve element seats on said beveled end of said exhalation stem in a second mode of operation to close said exhalation passage;

said valve body further having an inlet port disposed at said second portion of said passage;

a one-way valve disposed on said valve body in said passage in association with said inlet port.

4,898,166

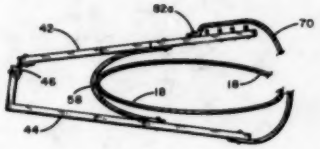
RESUSCITATION BAG CONTROL APPARATUS

Robert J. Rose, Easton, N.H., and Larry A. Sundsrud, Park Rapids, Minn., assignors to Physician Engineered Products, Inc., Park Rapids, Minn.

Filed Apr. 14, 1988, Ser. No. 183,134

Int. Cl.[4] A62B *7/00*

U.S. Cl. 128—205.13 **14 Claims**



1. An apparatus for removably securing and adjustably controlling the volume of fluid expelled from a self-recovering artificial resuscitation enclosure, the apparatus including:

first and second substantially rigid arms, and a connecting means mounted at a proximal end of each of said arms for pivotally connecting the arms for movement between closed and open positions;

a first substantially inextensible and pliable strap member fixed at an end thereof to a distal end portion of said first arm and a second substantially inextensible and pliable strap member fixed at its opposite ends to said first and second arms, and cooperating with said strap member and said arms to form a surrounding, contiguous engagement with said resuscitation enclosure, said second strap being on the opposite side of the resuscitation enclosure from said first strap and between said enclosure and said connecting means;

a fastening means for releasably coupling an opposite end of said first strap member at one of a plurality of discrete fastening locations along a distal end portion of said second arm, to releasably secure a self-recovering artificial resuscitation enclosure between said first and second arms, with said first and second arms and said first strap positioned in surrounding and contiguous relation to an outer surface of said resuscitation enclosure;

said arms movable into said closed position to elastically compress said enclosure to a minimum fluid volume, and returning to said open position responsive to an elastic recovery of said resuscitation enclosure to one of a plurality of predetermined expansion volumes, each of said expansion volumes corresponding to the coupling of said first strap at one of said discrete fastening locations.

4,898,167

AIDS PROTECTION VENTILATION SYSTEM

Richard S. Pierce, San Clemente, and Willem J. Van Leeuwen, Chino, both of Calif., assignors to Pakam Data Systems Inc., Wilmington, Del.

Filed May 13, 1988, Ser. No. 193,895

Int. Cl.[4] A62B *9/02*; A61M *16/08, 16/20*

U.S. Cl. 128—205.16 **14 Claims**

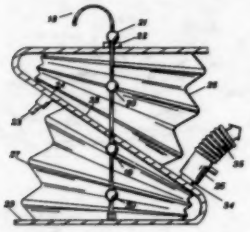
1. An Aids protection ventilation system comprising:

an adjustable spring loaded variable volume bellows, said bellows being usable to resuscitate a victim, and when used to resuscitate a victim, said bellows creating air pressure which forces air through;

an air delivery tube having a pressure relief valve and an oxygen inlet port that is connectable to an oxygen source;

an oxygen enrichment venturi valve that is used to input maximum oxygen into the air provided by said bellows, but, independent as to whether oxygen or said oxygen enrichment venturi valve is utilized the air from the bellows flows through the air delivery tube into;

a resuscitation airway valve having two ends and adapted to receive one of several optional inserts for improved performance, and a face mask, one end of said airway valve being connectable to said face mask, said face mask being placeable on a victim to supply air to the victim and another end of said airway valve being open to the atmosphere for exhausting the victim's exhaled air or fluid



wastes, said another open end of said airway valve being closable by the rescuer's hand when ventilation is needed, said bellows being compressed to force in fresh air from said bellows to the victim's lungs;

whereby said system in use enables the procedure to be performed without exposing the rescuer's mouth and lungs to the victim's mouth and fluids.

4,898,168

INFLATION INDICATORS FOR CUFFED TUBES

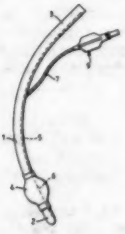
Bruce Yule, Hythe, England, assignor to Smiths Industries Public Limited Company, London, England

Filed Jan. 9, 1989, Ser. No. 294,772

Claims priority, application United Kingdom, Jan. 9, 1988, 8800447

Int. Cl.[4] A61M *25/00*

U.S. Cl. 128—207.15 **9 Claims**



1. An inflation indicator of the kind for a cuffed medico-surgical tube formed from an envelope with two opposite walls of a flexible gas-impermeable material, the envelope having respective fluid inlets at opposite ends one of which communicates with the cuff on the medico-surgical tube such that the envelope is inflated by pressure in the cuff, the improvement wherein one of said walls has a surface formation extending along the length of the envelope on an inner surface of the wall to provide a continuous fluid passage between the walls between the two inlets when said walls contact one another on collapse of the envelope.

4,898,169

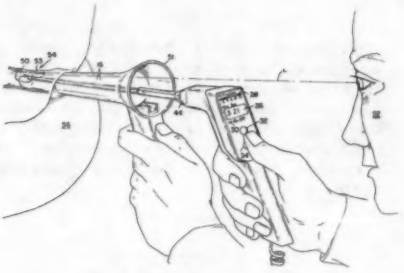
MEDICAL INSTRUMENT FOR THERAPY OF HEMORRHOIDAL LESIONS

Daniel A. Norman; Ronald R. Newton, both of Stateline, Nev.; Glenn V. Nicholas, Walnut Creek, Calif.; Steven Bellofatto, Closter, N.J., and Stephen K. Onody, Sherborn, Mass., assignors to Boston Scientific Corporation, Watertown, Mass.

Continuation-in-part of Ser. No. 47,698, May 8, 1987, abandoned, and a continuation-in-part of Ser. No. 47,712, May 8, 1987, and a continuation-in-part of Ser. No. 48,374, May 11, 1987, abandoned. This application Jun. 30, 1988, Ser. No. 213,597

Int. Cl.[4] A61B *17/36*

U.S. Cl. 606—42 **14 Claims**



1. An instrument for direct current electrical therapy of hemorrhoidal lesions or the like in a patient comprises a D.C. electric generator means, a grounding pad for the patient, a monopolar probe having a distal tip for penetration of the hemorrhoidal lesion to act as a negative electrode, and an instrument handpiece for support of the probe and control of the level of direct current,

said probe comprising a base and, extending therefrom, at least one elongated probe electrode terminating in said distal tip adapted for electricity-conducting engagement with a hemorrhoidal lesion,

said instrument handpiece comprising:

a lower handle portion sized and constructed to be gripped by a physician,

cooperative means for coupling said probe base to said handpiece in electricity-conducting engagement with the axis of said probe at an obtuse angle to the axis of said lower handle portion, arrangement of said probe and said lower handle portion at said obtuse angle allowing a physician to hold said instrument handpiece during treatment of a hemorrhoidal lesion without extended abnormal flexure of the wrist,

a therapy-monitoring an control upper handle portion disposed generally above said lower handle portion and having a front panel visible to the physician when the probe distal tip is penetrated into a hemorrhoidal lesion,

said front panel comprising

means for display of status of treatment conditions of said instrument, said means for display and the distal tip of said probe disposed generally in the same line of sight of a physician holding said lower handle portion with said distal probe tip penetrated into a hemorrhoidal lesion, and

means for control of the level of direct current disposed adjacent said lower handle portion in a manner to allow a physician to operate said means for control with digits of a hand gripping said lower handle portion,

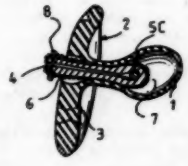
whereby a physician may simultaneously view a treatment site and observe conditions of treatment appearing on said means for display, while gripping the instrument and operating said means for control with one hand, leaving

the other hand free as he conducts therapy on a hemorrhoidal lesion.

4,898,170
SURGICAL KNIFE
Robert F. Hofmann, Littleton, and David B. Waldock, Brentwood, England, assignors to Duckworth & Kent Surgical Instruments Limited, Hertfordshire, United Kingdom and Medical Titanium Corporation, Clearwater, Fla.
Continuation of Ser. No. 891,721, Jul. 29, 1986, abandoned. This application Jun. 10, 1988, Ser. No. 206,936
Claims priority, application United Kingdom, Aug. 1, 1985, 8519364
Int. Cl.[4] A61F *17/32*
U.S. Cl. 606—166 7 Claims

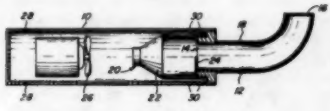
1. A surgical knife comprising a cutting blade, an elongated body, a head portion for receiving said cutting blade and adjustment means permitting adjustment of said blade within said head portion forwards and backwards lengthwise of the knife along a line extending at an angle of inclination to the longitudinal axis of the knife body, the head portion comprising a displaceable piston projecting into a chamber into which a blade holder for the blade is received, spring means acting to exert a biasing force on the piston, and a cranked member extending into the head portion of the knife body and having one arm bearing against the piston and another arm extending axially of the knife body.

4,898,171
STAY-IN-PLACE PACIFIER
Ernest Moss, 200 River Court Pkwy., Atlanta, Ga. 30328
Filed Dec. 30, 1987, Ser. No. 139,460
Int. Cl.[4] A61J *17/00*
U.S. Cl. 606—236 4 Claims



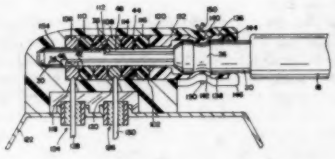
1. A pacifier for babies and infants, comprising:
a shield protector with a hole therethrough;
a nipple attached to a side of said shield protector so that said nipple substantially covers the hole of said shield protector, said nipple having a hollow storage area which is accessible through the hole of said shield protector; and
a handle resiliently attached to said hollow storage area of said nipple, said handle being continually capable of resilient storage within the hollow storage area of said nipple and being continually capable of removal or extension therefrom, by passage of said handle through the hole of said shield protector.

4,898,172
OPTICAL LIGHT PROBE
Richard J. Grable, 7400 SW. 13th St., Plantation, Fla. 33317
Filed Apr. 18, 1986, Ser. No. 853,394
Int. Cl.[4] A61F *7/00*
U.S. Cl. 128—397 3 Claims



1. A hand held light source probe for use with transillumination apparatus for tumor detection in human female breasts comprising:
a housing including a hollow heat insulating handle portions;
a pipe having proximal and distal ends extending longitudinally from one end of said housing, curing through substantially 90°, and terminating at its distal end in a plane surface;
a high intensity incandenscent reflectorized light source positioned in said housing to illuminate the proximal end of said light pipe;
a fixed opaque light shield of substantially less area than the proximal end of said light pipe so positioned in the projected light pahh of said bulb between said bulb and said pipe as to positively prevent the presence of a focal spot from said source on the distal end of said light pipe; and
means for positively circulating cooling air through said housing and over the outer surface of said bulb.

4,898,173
IN-LINE PACEMAKER CONNECTOR SYSTEM
Terry D. Daglow, Little Canada, and Richard D. Sandstrom, Scandia, both of Minn., assignors to Medtronic, Inc., Minn.
Division of Ser. No. 184,903, Apr. 22, 1988. This application Jun. 12, 1989, Ser. No. 364,300
Int. Cl.[4] A61N *1/00*
U.S. Cl. 128—419 P 5 Claims



1. An electrical connector system for coupling a medical, electrical lead to a medical device, comprising:
a connector housing mounted to said medical device, said connector housing including a longitudinal lumen, open at its distal end;
at least one electrical conductor extending from said medical device into said longitudinal lumen;
a plurality of resilient non-metallic generally ring shaped members each having a central opening of a first diameter mounted adjacent one another in said longitudinal lumen of said connector housing, wherein at least one of said plurality of ring shaped members is conductive and wherein at least a second one of said plurality of ring shaped members is non-conductive, and wherein said at least one conductive ring shaped member is mounted in electrical contact with said conductor extending from said medical device; and
a connector pin, insertable within said longitudinal lumen of said connector block and coupled to said medical electri-

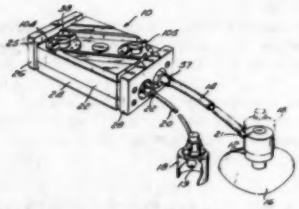
cal lead, said connector pin having a second, outer diameter larger than the inner diameter of said ring shaped members when located in said connector housing, whereby when said connector pin is inserted through said openings of said ring shaped members, said ring shaped members are compressed against said connector pin, said connector pin further comprising at least one conductive and at least one circumferential, non-conductive area arranged linearly along said connector pin such that when said connector pin is inserted into the lumen of said connector housing, said at least one conductive area on said connector pin contacts said at least one conductive ring shaped member and wherein said at least one non-conductive area of said connector pin contacts said at least one non-conductive ring shaped member.

4,898,174

AUTOMATIC VENTILATOR

Thomas F. Fangrow, Jr., Corona, Calif., assignor to Life Support Products, Inc., Irvine, Calif.

Filed May 3, 1988, Ser. No. 189,652
Int. Cl.[4] A62B 7/00; A61M 16/00
U.S. Cl. 128—204.24 **47 Claims**



1. An automatic ventilator system, comprising:
a demand valve assembly for supplying gas to a patient which includes a supply gas inlet and an inlet valve which will open in response to the patient's inhaling breathing demands, said assembly further including an exhaust valve which will open in response to the patient's exhaling demands; and
a pneumatic controller providing a control pressure to open said inlet valve for a predetermined period of time and at predetermined intervals to provide automatically a measured quantity of gas through the demand valve assembly to the patient at desired intervals, said control pressure being provided by said controller independently of said inhaling and exhaling demands, and said inlet valve being operable by patient inhaling demands independently of said control pressure.

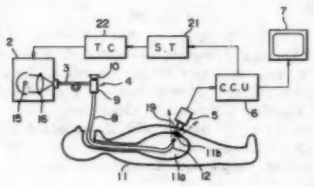
4,898,175

OUT-BODY OBSERVING APPARATUS

Toshiaki Noguchi, Tachikawa, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1987, Ser. No. 137,215
Claims priority, application Japan, Dec. 26, 1986, 61-313273
Int. Cl.[4] A61B 5/00
U.S. Cl. 128—634 **30 Claims**

1. An out-body observing apparatus comprising:
an endoscope having an elongated insertable part which can be inserted into a body cavity;
a light source device which can feed said endoscope with an illuminating light capable of illuminating the body cavity interior with light radiated from said insertable part;
an imaging means for detecting, outside the body, light from said illuminating light fed by said light source device, radiated from said insertable part onto a part to be observed and having passed through a living body tissue, and for producing, from said detected light, a projected image of the tissue;
a signal processing means for processing a video signal from said projected image obtained by said imaging means; and



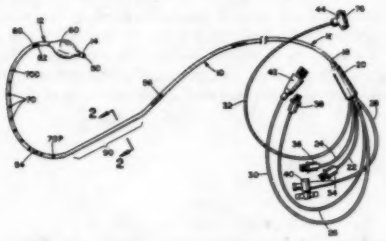
a displaying means which can display on a picture surface a video image of the observed part with the video signal output from said signal processing means.

4,898,176

CONTINUOUS CARDIAC OUTPUT BY IMPEDANCE MEASUREMENTS IN THE HEART

John H. Petre, Cleveland Heights, Ohio, assignor to The Cleveland Clinic Foundation, Cleveland, Ohio

Filed Jun. 22, 1988, Ser. No. 210,095
Int. Cl.[4] A61B 5/04, 5/02
U.S. Cl. 128—642 **21 Claims**



1. A diagnostic catheter for use in measuring cardiac output in the right ventricular chamber comprising:
(a) an elongated, multi-lumen, flexible member having a distal end and a proximal end, a first lumen extending the entire length of said member and terminating in a distal port, a second port extending through the side wall of said member at a location immediately proximate of said distal end of said flexible member and a second lumen extending from said proximal end of said member to said second port;
(b) an expandable sleeve surrounding said member and spanning said second port, said sleeve inflatable by a fluid introduced into the proximal end of said second lumen;
(c) a plurality of ring electrodes secured to the outer surface of said member at predetermined axial spacing including a distal ring electrode located a first predetermined distance proximal of said distal end of said flexible member, a proximal ring electrode located a second predetermined distance greater than said first predetermined distance from said distal end of said flexible member and a further plurality of intermediate ring electrodes disposed between said distal ring electrode and said proximal ring electrode;
(d) a plurality of electrical conductors extending longitudinally through a third lumen in said flexible member from said proximal end of said flexible member and individually connected to separate ones of said plurality of ring electrodes; and,

(e) a first stiffening member disposed in a fourth lumen in said flexible member and extending from a third predetermined distance to a fourth predetermined distance proximal of said distal end of said flexible member, said third and fourth distances being greater than said second predetermined distance.

4,898,177

ULTRASONIC PROBE WITH FINGER GRIP ADAPTER

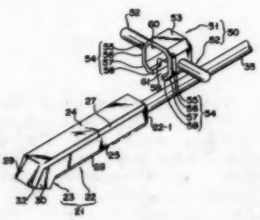
Masayuki Takano; Susumu Hiki, both of Ootawara, and Yunsiti Kikuti, Nasu, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 24, 1988, Ser. No. 172,546

Claims priority, application Japan, Mar. 26, 1987, 62-45426[U]

Int. Cl.[4] A61B 8/00

U.S. Cl. 128—662.03 **9 Claims**



1. A probe assembly and a finger hook adapter attached thereto,

said probe assembly comprising:

a pencil-type ultrasonic probe including an elongated body and a transducer element arranged at a distal end of the elongated body; and

a cable including one end fixed to a proximal end of the elongated body and another end adapted to be connected to an ultrasonic diagnosis apparatus,

said finger hook adapter comprising:

an elastically deformable member having inner surfaces defining a shape similar to an outer shape of said elongated body, said inner surfaces forming a through-hole in which the elongated member of said probe is adapted to be inserted, said member formed with a guide slit for guiding the cable into the through-hole, and an outer wall, said deformable member being elastically deformed when the cable is pressed against the guide slit, in a manner to widen a gap of the guide slit, and being elastically deformed when the proximal end of the elongated body is pressed against the inner surfaces forming the through-hole, in a manner to slightly widen the through-hole and to allow the elongated body to be inserted into the through-hole, whereby the elastically deformable member is elastically held by the elongated body; and

a rod-shaped finger hook member extending from the outer wall of the ring-shaped member, said rod-shaped finger hook member adapted for allowing fingers of an operator to be hooked thereon, to keep said probe at a predetermined position with respect to the operator.

4,898,178

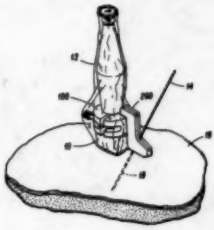
MONOLITHIC DISPOSABLE NEEDLE GUIDE FOR ULTRASOUND TRANSDUCERS

Victor J. Wedel, P.O. Box Q, Kalona, Iowa 52247

Continuation of Ser. No. 42,387, Apr. 24, 1987, abandoned. This application Feb. 22, 1989, Ser. No. 314,291

Int. Cl.[4] A61B 8/00

U.S. Cl. 128—662.05 **5 Claims**



1. A needle guide for use with an ultrasound transducer in medical procedures, comprising in operative combination:

(a) a monolithic member having at least one groove therein for receiving a needle;

(b) a mounting bracket for attachment to the transducer and said mounting bracket having for receiving said monolithic member;

(c) said monolithic member having a notch therein for cooperating with said bracket;

(d) said monolithic member further having a first portion, a second portion, and a hinge connecting said first portion with said second portion;

(e) said first portion having at least one groove therein for receiving a needle;

(f) said first portion further having a notch therein for receiving said bracket; and

(g) said second portion further having a notch therein for receiving said bracket.

4,898,179

DEVICE FOR DETECTING, MONITORING, DISPLAYING AND RECORDING OF MATERIAL AND FETAL VITAL SIGNS AND PERMITTING COMMUNICATION BETWEEN A WOMAN AND HER FETUS

Vladimir Sirota, 2111 Jefferson Davis Hwy., Apt. 803 South, Arlington, Va. 22202

Continuation-in-part of Ser. No. 60,812, Jun. 12, 1987, abandoned, which is a continuation-in-part of Ser. No. 745,684, Jun. 17, 1985, Pat. No. 4,672,975. This application Jul. 22, 1988, Ser. No. 223,011

Int. Cl.[4] A61B 5/02

U.S. Cl. 128—670 **39 Claims**

35. An obstetrical device for monitoring and displaying a representation of the heartbeats of a pregnant woman and her fetus, said device comprising:

a housing;

a first sensor circuit in said housing for detecting the heartbeat of the pregnant woman and generating a first electrical signal representative of that heartbeat;

first display means in said housing connected to said first sensor circuit and responsive to the first electrical signal for providing a first visual signal representative of the pregnant woman's heartbeat;

a second sensor circuit in said housing for detecting the heartbeat of the fetus and generating a second electrical signal representative of that heartbeat; and

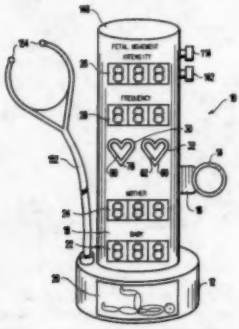
second display means in said housing connected to said second sensor circuit and responsive to the second electri-

cal signal for providing a second visual signal representative of the fetal heartbeat.

36. An obstetrical device for providing audio stimuli to a fetus and monitoring and displaying a representation of fetal response to said stimuli, comprising:

a housing;

a microphone connected to said housing;



a speaker, operably connected for transmitting audio stimuli from said microphone, disposed adjacent a lower portion of said housing adapted for abutment with a mother's abdomen; and

a sensor circuit in said housing for monitoring fetal response to said audio stimuli.

4,898,180

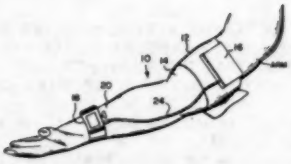
PERSONAL BLOOD PRESSURE MONITOR

Susan E. Farrelly, 150 East 69th St., New York, N.Y. 10021, and George Spector, 233 Broadway, Rm. 3815, New York, N.Y. 10007

Filed Sep. 23, 1987, Ser. No. 100,299

Int. Cl.[4] A61B 5/02

U.S. Cl. 128—681 **4 Claims**



1. A blood pressure monitoring device which comprises:

(a) a cuff inflatable to a desired pressure adapted to encircle an arm of a person;

(b) a housing on said cuff;

(c) a digital watch adapted to encircle the wrist of the person provided with means for controlling said pressure and for displaying pulse and blood pressure readings;

(d) a pressure regulating means extending from said digital watch to said housing for inflating said cuff, said pressure regulating means controlled from said digital watch by the first said means to inflate said cuff at predetermined time settings;

(e) a monitoring unit extending from said cuff and said housing to said digital watch, said monitoring unit being responsive to intensity of blood pressure pulses from the person coming through said cuff and heart beat pulses from the person coming through said housing into said digital watch; and

(f) means for recording blood pressure readings at preset time intervals wherein said readings can be displayed on said watch.

4,898,181

METHOD OF ILLUSTRATING ELECTROCARDIOGRAPHIC VALUES

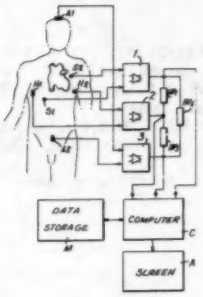
M. Kessler, Waldstrasse 6, D-8520 Erlangen, Fed. Rep. of Germany

Continuation of Ser. No. 919,751, Oct. 14, 1986, abandoned. This application Oct. 19, 1988, Ser. No. 262,107

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1985, 3536658

Int. Cl.[4] A61B 5/04

U.S. Cl. 128—699 **12 Claims**



1. A method of recording electrocardiographic values of an actual heart muscle, comprising the steps of applying scanning electrodes to predetermined locations of a patient's body, picking up electric signals delivered by said electrodes at time intervals which are small with respect to a total cycle of the heart muscle; amplifying the pick-up signals, and converting the same into digitalized vector data; feeding the vector data into a computer programmed for computing from the vector data coordinate values of discrete sectional planes SF1,SF2 . . .) of the heart muscle superimposed at distances; computed from the vector data during the heart muscle cycle; and graphically displaying at said time intervals changes of said superimposed planes to provide a live heart model (HM) showing the expansion processes of the heart muscle.

4,898,182

APPARATUS FOR EVALUATING HEART FITNESS

Brian Hawkins, 8 MacDonald Ave.; Jerald Greenberg, 34 Maple Ave.; Ofer Alon, 6 MacDonald Ave., all of Armonk, N.Y. 10504; Victor Marten, 144-45, 41 Ave., Apt. 3S, Flushing, N.Y. 11355; Edward Banyai, 133 Woodland Ave., New Rochelle, N.Y. 10805; Jennifer A. Edwards, 8 MacDonald Ave., Armonk, N.Y. 10504; David M. Banyai, 133 Woodland Ave., New Rochelle, N.Y. 10805; Juan C. Sanchez; Eran Sitnik, both of 137 Old Kisco Rd., Armonk, N.Y. 10504, and Joseph A. Yozzo, 17 Lawrence St., Mt. Kisco, N.Y. 10549

Filed Feb. 4, 1988, Ser. No. 152,113

Int. Cl.[4] A61B 5/04

U.S. Cl. 128—707 **10 Claims**

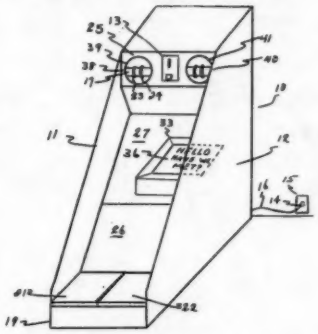
1. Apparatus for evaluating the fitness of the heart of a person, said apparatus including:

(a) means, adapted to be operable by said person, for selecting sex data and age data, individual to said person, from a plurality of sex data and age data, for classifying said person among other persons on the basis of sex and age;

(b) means for instructing said person in a format of an exercise designed to increase a beat rate of said person's heart;

(c) exercise means for engagement by said person for changing said beat rate of said heart, said exercise means including exercise pace detecting means for monitoring the pace

at which said person is performing said exercise while said person is engaged in said exercise and exercise pace control means for communicating to said person instructions for slow-up or slow-down or maintain constant the pace at which said exercise is being performed for maintaining said pace at a predetermined pace;



(d) means for monitoring said heart after said person performs said exercise for determining a recovery rate of said heart from an increased beat rate toward a slower beat rate; and

(e) means for comparing said recovery rate of said person's heart with heart beat recovery rates of persons in the same classification as said person for evaluating the fitness of said heart of said person.

4,898,183

APPARATUS AND METHOD FOR INSERTION OF COCHLEAR ELECTRODE ASSEMBLY

James Kuzma, Cherrybrook, Australia, assignor to Cochlear Pty. Limited, Lane Cove, Australia

Continuation of Ser. No. 77,445, Jul. 24, 1987, abandoned. This application Jun. 20, 1989, Ser. No. 368,979

Int. Cl.[4] A61N *1/00*

U.S. Cl. 128—784 **13 Claims**

1. A cochlear electrode lead assembly comprising a lead with a distal end and a proximal end including an array of electrodes on an external surface of said lead proximate said distal at one end and a resilient collar surrounding said lead and attached thereto at a region between said array and said proximal end, and means for permanently affixing a first circumferencial end of said collar to said lead only at said region.

4,898,184

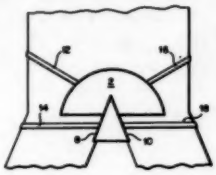
MALE AND FEMALE CONDOMS FOR THE PREVENTION OF THE TRANSMISSION OF AIDS AND OTHER VENEREAL DESEASES

Boris Skurkovich, 18 Blaisdell Ave., Pawtucket, R.I. 02860, and Simon Skurkovich, 802 Rollins Ave., Rockville, Md. 20852

Filed Oct. 23, 1987, Ser. No. 111,586

Int. Cl.[4] A61F *5/44*

U.S. Cl. 128—844 **12 Claims**



1. A genital receptacle consisting essentially of a resilient and flexible unitary body construction of rubber latex having an apron portion adapted to cover the pubic area of a human, thigh portions adapted to cover the perineum area of a human and a genitalia portion adapted to cover the surfaces of the genitalia of a human, a spermicide on the outside thereof and said spermicide containing antibodies to viruses and bacteria.

4,898,185

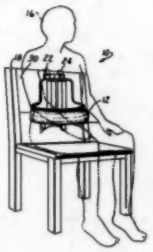
BACK TRACTION DEVICE FOR USE WITH CHAIRS

Ernest Fuller, Walled Lake, Mich., assignor to Life Support, Inc., Walled Lake, Mich.

Filed Feb. 24, 1989, Ser. No. 314,970

Int. Cl.[4] A61F *13/00*

U.S. Cl. 128—876 **11 Claims**



1. A method of relieving some of the pressure on the disc of the lower back of a person comprising the steps of:

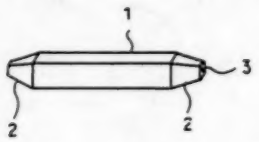
(A) securing a halter around the person's waist;

(B) securing a traction device to a chair having a seat; and

(C) adjustably attaching the halter to the traction device when the person is seated in the seat;

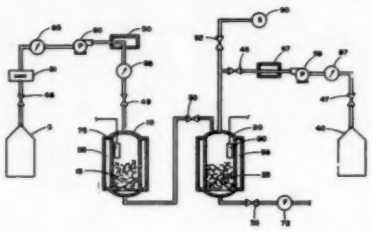
(D) said halter being formed with hook and loop fastener portions at its rear and the traction device being formed with mating hook and loop fastener portions that secures the halter to the traction device, the use of the hook and loop fastener portions allowing the traction device and the halter to be adjustably attached at any one of a variety of positions.

4,898,186
OSTEOSYNTHETIC PIN
Yoshito Ikada; Hyu H. Suong; Yoshihiko Shimizu, all of Uji; Satoshi Watanabe; Tatsuo Nakamura, both of Kyoto; Masakazu Suzuki, Ayabe, and Takeshi Shimamoto, Nagaokakyo, all of Japan, assignors to Gunze Limited, Ayabe, Japan
PCT No. PCT/JP87/00673, § 371 Date Apr. 29, 1988, § 102(e) Date Apr. 29, 1988, PCT Pub. No. WO88/01849, PCT Pub. Date Mar. 24, 1988
PCT Filed Sep. 11, 1987, Ser. No. 199,412
Claims priority, application Japan, Sep. 11, 1986, 62-215077
Int. Cl.[4] A61F 5/04, 2/28
U.S. Cl. 606—62 6 Claims



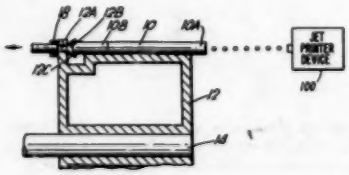
1. An osteosynthetic pin obtained by shaping a poly-L-lactic acid having a molecular weight of at least about 70,000 and axially drawing the shaped body about 2 to about 10 times at an elevated temperature of about 70° to about 120° C.

4,898,188
TOBACCO PROCESSING
Benjamin F. Niven, Jr., Winston-Salem, and Charles D. Mays, Lewisville, both of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.
Continuation of Ser. No. 944,076, Dec. 22, 1986, Pat. No. 4,727,889. This application Feb. 24, 1988, Ser. No. 159,806
Int. Cl.[4] A24B 15/24, 15/26
U.S. Cl. 131—296 26 Claims



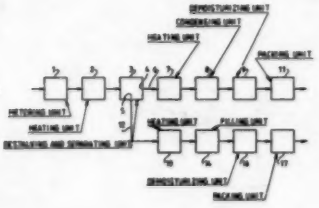
1. A process for extracting tobacco material, the process comprising:
(a) extracting tobacco components from a first tobacco material in cut filler form with a fluid under supercritical conditions thereby providing extracted tobacco components within the fluid; and then directly
(b) contacting the tobacco components extracted from the first tobacco material with a second tobacco material.

4,898,187
CIGARETTE MANUFACTURE
Dennis Hinchcliffe, London, England; Francis A. M. Labbe, Neuilly-sur-Seine, France; Desmond W. Molins, London, England, and Paul R. Wiese, London, England, assignors to Molins PLC, London, United Kingdom
Division of Ser. No. 909,234, Sep. 19, 1988, Pat. No. 4,785,831. This application Sep. 20, 1988, Ser. No. 246,676
Claims priority, application United Kingdom, Aug. 22, 1984, 8421320
Int. Cl.[4] A24C 5/60
U.S. Cl. 131—284 12 Claims



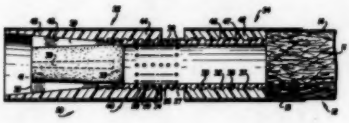
1. A method of treating cigarettes in which the cigarettes are conveyed sideways past nozzle means, spaced from the tobacco ends of the cigarettes and directed thereto, including the steps of supplying liquid adhesive to the nozzle means and operating the nozzle means while each successive cigarette is aligned therewith and spaced therefrom to project a measured quantity of adhesive onto the end of each cigarette from the nozzle means.

4,898,189
METHOD OF AND APPARATUS FOR TREATING UNCURED TOBACCO
Waldemar Wochnowski, Hamburg-Meiendorf, Fed. Rep. of Germany, assignor to Körber AG, Hamburg, Fed. Rep. of Germany
Filed Jul. 7, 1988, Ser. No. 216,424
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1987, 3723040
Int. Cl.[4] A24B 15/00
U.S. Cl. 131—299 56 Claims



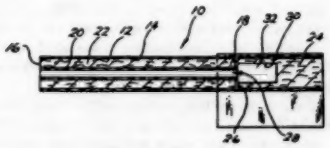
1. A method of treating uncured tobacco leaves which have a moisture content of less than 25 percent, normally between 13 and 17 percent, and contain ribs and strips, comprising the steps of heating the leaves in an electric high-frequency heater to a temperature of 50°–100° C.; and thereupon subdividing the leaves into strips and ribs.

4,898,190
ADJUSTABLE AIR DILUTION CIGARETTE WITH PRESSURE DROP COMPENSATION
Philip A. Deal, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.
Filed Mar. 1, 1989, Ser. No. 317,330
Int. Cl.[4] A24D *3/04, 3/18*
U.S. Cl. 131—336 12 Claims



1. A cigarette including a rod of smokable material and a filter element, said cigarette comprising filter assembly means for connecting the filter element to the smokable rod, said filter assembly means including air dilution means for admitting diluent air to the cigarette, means for adjusting the amount of diluent air admitted to the cigarette, and means for increasing the pressure drop of the cigarette as the amount of diluent air is increased, said means for increasing the pressure drop comprising means for supplying a compressive force to the filter element as the amount of diluent air admitted to the cigarette is increased.

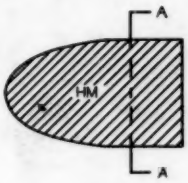
4,898,191
SMOKING DEVICE
Robert R. Johnson, and Tilford F. Riehl, both of Louisville, Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.
Filed Dec. 9, 1988, Ser. No. 281,584
Int. Cl.[4] A24B *15/00*
U.S. Cl. 131—359 10 Claims



1. A smoking device comprising:
a fuel column;
means defining a passage concentrically extending entirely through the fuel column having an impermeable wall;
a flavor releasing material filling the passageway;
a filter rod located at one end of the fuel column coaxial therewith, the filter rod being in flow communication only with the passage;
a pocket formed in the filter rod in coaxial alignment with the passage; and,
a flavor releasing material filling the pocket.

4,898,192
HOLOGRAPHIC FALSE NAILS
Allen L. Cohen, 10010 Walsham Ct., Richmond, Va. 23233
Filed Oct. 12, 1988, Ser. No. 256,582
Int. Cl.[4] A45D *29/00*
U.S. Cl. 132—73 7 Claims

1. An artificial fingernail which comprises:
(a) a carrier nail body with a top surface and a bottom surface, said carrier nail body contoured to fit onto a natural fingernail; and wherein
(b) the bottom surface has means for securing said artificial fingernail to the natural fingernail; and



(c) a hologram is affixed to and covering at least a part of the top surface of said carrier nail body, whereby said hologram functions to create an image that has three dimensional depth.

4,898,193
BRUSH FOR THE APPLICATION OF COSMETIC PRODUCTS
Jean-Louis Gueret, Paris, France, assignor to L'Oreal, Paris, France
Filed Oct. 20, 1987, Ser. No. 110,526
Claims priority, application France, Oct. 24, 1986, 86 14774
Int. Cl.[4] A45D *40/26*
U.S. Cl. 132—218 10 Claims

1. A brush for the application of cosmetic products, comprising:
(a) an elongated core, and
(b) a plurality of bristles, wherein
said bristles are fixed around said core in a helical array with said bristles extending generally radially of said core and being shaped to form longitudinal rows of bristles arranged in sets, the bristles forming said rows having longer length than bristles immediately adjacent said rows, said bristles of one set of longitudinal rows having ends longer than those of another set of longitudinal rows of shorter length bristles, the ends of said bristles of longer length being milled to define ridges at the periphery of the brush having a thickness no greater than 1.5 mm, and wherein the ends of said bristles situated between adjacent ridges define a surface envelope having a concave profile.

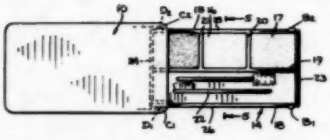
4,898,194
HAIR TREATMENT DEVICE AND METHOD
Connie J. Elnspahr, Rt. #1 Box #92, Roseland, Nebr. 68973
Filed Nov. 16, 1987, Ser. No. 120,965
Int. Cl.[4] A45D *6/00*
U.S. Cl. 132—251 8 Claims

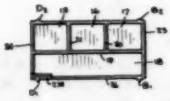
5. In combination with a conventional elongated permanent rod having an associated hair securement band, means for insertion between said securement band and hair of an individual wound around said permanent rod, said means for insertion comprising:
a thin flexible strip of plastic material;
said strip having a width of approximately one half inch, a

thickness of approximately one thirty seconds of an inch and a length between two and three and one half inches; said strip provided with a row of closely spaced circular apertures;

and
said strip having radiused ends.

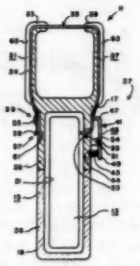
4,898,195
SLIDING DRAWER COSMETIC COMPACT
Morris Sussman, Freeport, N.Y., assignor to Shore Plastics, Inc., Freeport, N.Y.
Filed Jun. 3, 1985, Ser. No. 740,477
Int. Cl.[4] A45D *40/00*
U.S. Cl. 132—317 8 Claims





1. A travel cosmetic compact comprising:
A a molded plastic rectangular case having an open front end which is flanked by a pair of side catches;
B a molded plastic drawer slidable in said case and having at least one cell for containing a cosmetic supply, said drawer being provided with a bottom wall, front and rear walls and side walls, to define a rectangular frame, one of said side walls having a rear section which is detached from the bottom wall and the rear wall to define a flexible tine; and
C a pair of detents, one of which is formed on the free end of the tine, the other being formed at a corresponding position on the second side wall, said detents being adapted to engage the side catches of the case when the drawer is fully retracted to expose the cell and to prevent withdrawal of the drawer, said tine when the drawer is fully retracted at which position the tine is partially exposed being depressible to effect disengagement of the detent thereon from the side catch engaged thereby whereby the drawer may then be withdrawn from the case and replaced by another drawer.

4,898,196
FLOSSING DEVICE
W. Jeter Eason, 150 Goodwyn, Memphis, Tenn. 38111
Filed May 8, 1989, Ser. No. 348,964
Int. Cl.[4] A61C *15/00*
U.S. Cl. 132—327 4 Claims



1. A flossing device for use by a user in combination with dental floss to floss teeth, said flossing device comprising:
(a) handle means for being held by the user, said handle means having a forward end, having a hollow interior for holding said dental floss and having an aperture extending from said hollow interior for allowing the distal end of said dental floss to extend outward from said hollow interior;
(b) a first arm member extending outward from said forward end of said handle means, said first arm member having an outer end positioned a spaced distance from said forward end of said handle means;
(c) a second arm member extending outward from said forward end of said handle means, said second arm member having an outer end positioned a spaced distance from said forward end of said handle means and from said outer end of said first arm member; and
(d) positioning means for positioning a portion of said distal end of said dental floss between said outer end of said first arm member and said outer end of said second arm member and for holding said portion of said distal end of said dental floss tight between said outer end of said first arm member and said outer end of said second arm member, said positioning means including first lock means for locking said dental floss relative to said first arm member, and second lock means for locking said dental floss relative to said second arm member; said first lock means including a grip member movable between a first position in which said dental floss is locked relative to said first arm member and a second position in which said dental floss is free relative to said first arm member, and spring means for urging said grip member to said first position; said grip member including a lever member having a first end, a second end, and a midportion; said grip member including pivot means for pivotally attaching said midportion of said lever member to said handle means; said spring means being associated with said lever member for normally urging said first end of said lever member toward said handle means to clamp said dental floss between said first end of said lever member and said handle means; said first end of said lever member moving away from said handle means and releasing said dental floss when the user applies pressure to said second end of said lever member against said spring means.

4,898,197

CLEANING OF TUBES USING PROJECTILES

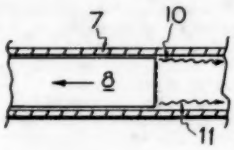
Peter L. Barry, Blackburn, and Robert W. Vowles, Flemington, both of Australia, assignors to Lacrosa Nominees Pty. Ltd., Camberwell, Australia

Continuation-in-part of Ser. No. 858,859, Apr. 30, 1986, Pat. No. 4,724,007, which is a continuation of Ser. No. 648,882, Sep. 10, 1984, abandoned, which is a continuation-in-part of Ser. No. 527,269, Aug. 29, 1983, abandoned. This application Nov. 16, 1987, Ser. No. 120,942

Claims priority, application Australia, Mar. 11, 1983, 12433/83; PCT Int'l Appl., Aug. 17, 1984, PCT/AU84/00159

Int. Cl.[4] B08B *9/04*

U.S. Cl. 134—8 11 Claims



1. A method of cleaning tubes, using at least one solid substantially incompressible projectile having an outer diameter no greater than that which forms a loose sliding fit within a tube to be cleaned, wherein said projectile is propelled through said tube by a substantially instantaneous release of a flow of a pressurized cleaning liquid against one surface of said projectile, said projectile being propelled through said tube ahead of substantially all of the cleaning liquid at a speed of at least ten meters per second, such that cavitation-like turbulence is produced rearwardly of the projectile to effect cleaning of said tube as the projectile travels along said tube, and said projectile is propelled without substantial mechanical scraping contact with the inner walls of said tube.

4,898,198

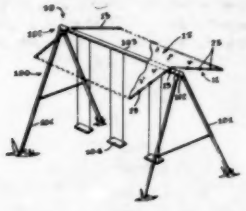
CANOPY APPARATUS FOR CHILDREN'S SWINGS

Gerald E. Castlebury, Rte. 2, Box 144C, Ruther Glen, Va. 22546

Filed Feb. 1, 1989, Ser. No. 304,638

Int. Cl.[4] A63G *9/00*; E04H *15/58*

U.S. Cl. 135—90 2 Claims



1. A canopy apparatus in combination with a swing construction including a pair of vertically disposed A-frame support members operatively connected on their upper ends to a horizontal support bar wherein the canopy apparatus consists of:

a pair of support units wherein each support unit comprises: an elongated support arm having a pair of inboard apertures disposed on opposite sides of the midpoint of the support arm; a clamp member adapted to engage the bottom of the horizontal support bar; and a pair of elongated securing elements operatively engaged with the clamp member and dimensioned to project through the pair of inboard apertures in the support arm to captively engage a portion of the horizontal support bar; wherein, each of said support arms are provided with an inverted generally shallow V-shaped configuration; and,

a cover unit comprising a generally rectangular cover member fabricated from an opaque sheet of material; wherein, opposed sides of the cover member are provided with a plurality of spaced grommets and further provided with a plurality of tether elements which extend through said grommets and operatively attach said cover unit to said support units.

4,898,199

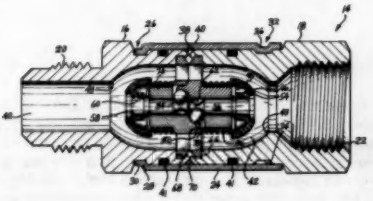
BREAKAWAY FLUID COUPLING

John M. Morris, Auburn; Zdenek Gabrlik, Seattle, and Charles J. Green, Vashon, all of Wash., assignors to GT Development Corporation, Tukwila, Wash.

Filed Feb. 7, 1989, Ser. No. 307,736

Int. Cl.[4] F16K *17/40*

U.S. Cl. 137—68.1 24 Claims



1. A breakaway fluid coupling comprising:

a first valve body, and a separate second valve body; said bodies defining a flow passage through the coupling;

a sleeve having a first end connected to said first body by a first joint that is detachable by bending forces of a first predetermined magnitude and resistant to tension forces of a second predetermined magnitude, and an opposite second end connected to said second body by a second joint that is detachable by tension forces of said second predetermined magnitude and resistant to bending forces of said first predetermined magnitude; and

a valve element positioned in each of said valve bodies to allow flow through said passage when said bodies are connected by the sleeve, and to close said passage when at least one of said joints is detached.

4,898,200

ELECTROPNEUMATIC TRANSDUCER

Katsuhiko Odajima, and Motoshige Ikehata, both of Sokka, Japan, assignors to Shoketsu Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 729,188, May 1, 1985, abandoned. This application Apr. 21, 1989, Ser. No. 341,269

Claims priority, application Japan, May 1, 1984, 59-88178; Feb. 8, 1985, 60-23094

Int. Cl.[4] G05D *16/20*

U.S. Cl. 137—85 3 Claims

1. An electropneumatic transducer comprising:

(a) a body having supply and output ports;

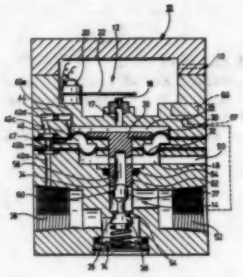
(b) a nozzle flapper mechanism disposed in said body for varying a nozzle back pressure in response to the displacement of a nozzle flapper thereof;

(c) an inner valve disposed in a passage connecting said supply port and said output port for opening and closing said passage under the action of a diaphragm assembly operative in response to said nozzle back pressure;

(d) said nozzle flapper comprising an electrostrictive element displaceable dependent on a change in an electric signal applied thereto;

(e) said inner valve comprising a nonbleed-type pilot valve;

(f) said diaphragm assembly comprising two flexible diaphragms centrally coupled together by a joining member held in engagement with said inner valve, said nozzle flapper mechanism including a nozzle having a communication hole opening toward one of said diaphragms, the other diaphragm facing into an atmospheric-pressure chamber defined in said body and vented to atmosphere,



wherein said two diaphragms define a chamber therebetween held in communication with said supply port through a passage defined in said body so that a supply pressure is supplied from said supply port into said chamber, said one diaphragm having one surface subjected to the nozzle back pressure, said other diaphragm having one pressure subjected to the atmospheric pressure in said atmospheric-pressure chamber.

4,898,201

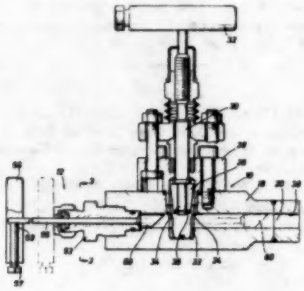
PORTABL TOOL FOR CLEANING VALVE BORES AND ASSOCIATED INLET PASSAGE

Jeff A. Conley, Sugar Land, and Jeffrey T. Lynch, Houston, both of Tex., assignors to Keystone International, Inc., Houston, Tex.

Filed Feb. 9, 1989, Ser. No. 308,000

Int. Cl.[4] B08B *1/00, 9/06;* **F16L** *55/00*

U.S. Cl. 137—245.5 **7 Claims**



7. For use with a valve having a valve body with a central bore therethrough defining a main bore portion, a valve member mounted for movement between open and closed positions relative to said central bore, said central bore defining an end opening including an intermediate diameter bore portion and a large diameter bore portion with an inner annular shoulder at the juncture of said main bore portion and said intermediate bore portion, and an outer annular shoulder at the juncture of the intermediate bore portion and the large diameter bore portion, said large diameter bore portion defining internal screw threads therein, said valve body adapted to receive the inner end of a flow line in abutting relation against said inner annular shoulder, and an externally threaded nut mounted about said flow line in threaded relation with said internally threaded bore portion for removably securing said flow line within said end opening;

the improvement of a portable cleaning tool for cleaning said valve bore adapted to be removably connected within said end opening upon removal of said flow line and associated nut; said portable cleaning tool comprising:

a tool connector having an elongate body with a central bore therethrough;

a rod extending through said bore having a handle on an outer end thereof and an enlarged diameter cleaning member on the inner end thereof, said cleaning member being generally cylindrical in shape with a trailing end surface to define an annular seat, and an inclined leading end surface to define a leading scraping edge;

said elongated body of said connector having means for engaging said annular seat of said cleaning member in a retracted position to prevent outward movement thereof, a main intermediate body portion of a generally uniform cross section, an externally threaded outer end portion, an inner end portion of a reduced diameter defining a tapered shoulder at its juncture with said intermediate portion, a first annular groove about said reduced diameter inner end portion, an O-ring received within said first annular groove, and a second annular groove about said intermediate body portion outwardly of said tapered shoulder;

a retainer ring received within said second annular groove and extending laterally over the adjacent outer end of said valve body;

a first internally threaded nut receiving said elongate body and retainer ring and threaded onto the external screw threads of said valve body adjacent the end of said body for compressing said retainer ring against the end of said valve body and holding said connector body within said end opening of said valve body;

a packing extending about said rod and received within the outer end of said connector body; and

a second internally threaded nut threaded onto said outer end portion of said connector and compressing said packing for sealing about said rod.

4,898,202

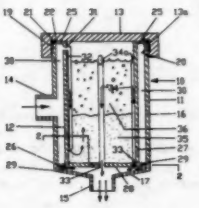
FERTILIZER CONTAINER FOR SPRINKLER SYSTEM

James R. Craig, 2925 Cody St., Riverside, Calif. 92503

Continuation-in-part of Ser. No. 205,062, Jun. 10, 1988, which is a continuation-in-part of Ser. No. 78,165, Jul. 27, 1987, Pat. No. 4,750,512. This application May 16, 1989, Ser. No. 352,923

Int. Cl.[4] B01D *11/02*

U.S. Cl. 137—268 **4 Claims**



1. A fertilizer applicator for a sprinkler system, comprising:

A. a container for holding said solid fertilizer, including: integrally formed upper and lower end flange members, a continuous sidewall member and bottom member joined thereto, the bottom member providing at least one outlet bore and corresponding connecting upstanding drain pipes having upper entry ports for a solution of fertilizer to pass therethrough, the said sidewall providing an inlet

bore, and connecting water line terminating near the bottom member for water to pass therethrough at a controlled rate and dissolve the said solid fertilizer, the lower flange member providing bores to permit water to drain therethrough;

B. an enclosure case for the container, including:

i. water inlet and outlet means, for water and diluted fertilizer solution, respectively;

ii. a sidewall portion for enclosing the sidewall member of the container;

iii. the container being removably secured by the upper flange member to the enclosure, thereby spacing the sidewall portion of the enclosure case and the sidewall member of the container; whereby:

i. water fed into the inlet will be pressured between the sidewalls and through the inlet bore of the sidewall member to dissolve the fertilizer, and form a solution of fertilizer which rises to the level of the entry ports of the drain pipes;

ii. water draining from the bores in the lower flange member will dilute the fertilizer solution draining from the drain pipes and connecting outlet bores to reduce fertilizer burning; and,

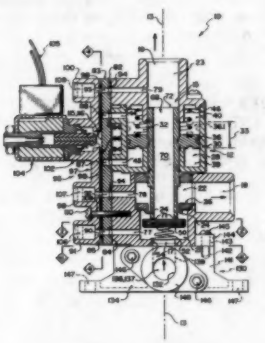
iii. when the fertilizer is dissolved, water is passed through the bores of the lower flange member and the outlet bores of the bottom member and outlet of the applicator, and then to the sprinkler system.

4,898,203

VALVE APPARATUS

Jacob Kobelt, 6110 Oak St., Vancouver, British Columbia, Canada V6M 2W2

Filed Sep. 22, 1988, Ser. No. 247,725
Int. Cl.[4] F15B *13/043*
U.S. Cl. 137—269 **32 Claims**



1. A valve apparatus including:

(a) a valve body having: an axially disposed main chamber; an inlet port, and outlet port and an exhaust port communicating with the main chamber; a valve seat disposed between the main chamber and the inlet port; and axially disposed piston chamber, and first and second piston ports communicating with the piston chamber and being accessible at an outer surface of the body,

(b) a valve poppet member engageable with the valve seat to seal the main chamber from the inlet port,

(c) a piston dividing the piston chamber into first and second piston spaces, the piston being reciprocable within the piston chamber between first and second extreme positions within the piston chamber, the first and second piston spaces communicating with the first and second piston ports respectively,

(d) a valve actuator cooperating with the piston and the poppet valve member to actuate the valve member when required,

(e) piston biasing means for biasing the piston to apply force thereto, the piston biasing means being located within the first piston space to apply force to the piston in a first direction, the piston biasing means also being alternatively locatable within the second piston space to apply force to the piston in a second direction opposite to the first direction, so that direction of force of the biasing means is selectable to move the piston to an extreme position thereof in either direction,

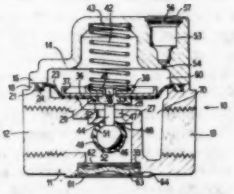
(f) fluid signal input means for receiving fluid signals and communicating with a fluid supply, the fluid signal input means being releasably secured to the valve body adjacent to both piston ports so as to communicate therewith, the fluid signal input means having inner and outer portions, the outer portion having an input signal connection to receive an input signal, and the inner portion having interchangeable conduit means for providing at least one interchangeable conduit for selectively communicating with a requisite piston port, the interchangeable conduit means communicating with the fluid supply and having an inlet conduit extending from the input signal connection to the second piston space to supply a fluid force to the piston in opposition to the piston biasing means, and an outlet conduit extending from the first piston space to exhaust fluid from the first piston space, the interchangeable conduit means having a periphery which encloses the two piston ports so that, if required, the interchangeable conduit means could alternatively provide a conduit from the input signal connection to the first piston space to supply a fluid force to the piston in opposition to force from the piston biasing means which can be alternatively located in the second piston space.

4,898,204

LOW PRESSURE GAS REGULATOR

Elmer E. Wallace, Fort Wayne, Ind., assignor to SCP, Inc., Auburn, Ind.

Filed Jan. 11, 1989, Ser. No. 295,501
Int. Cl.[4] G05D *16/06*
U.S. Cl. 137—505.41 **3 Claims**



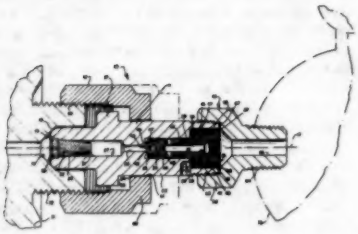
1. A low pressure gas regulator comprising a body member, an inlet opening formed in said body member, an outlet opening formed in said body member, a partition in said body member which separates said inlet and outlet opening and formed with an opening which is surrounded with a valve seat, a moveable diaphragm mounted in said body member so as to have atmospheric pressure on one side thereof and the pressure of the outlet opening on the ohter side, a valve stem connected to said diaphragm and extending through said opening in said partition, a ball valve mounted on said valve stem in said inlet opening, and a relatively thick soft resilient cover mounted over said ball valve and engageable with said valve seat, and wherein said cover has a first thicker portion which engages said valve seat and a second portion which does not engage said valve seat which is thinner than said first portion.

4,898,205

STEM REGULATOR

Albert Ross, Elyria, Ohio, assignor to Western/Scott Fetzer Company, Westlake, Ohio

Filed Sep. 14, 1988, Ser. No. 244,827
Int. Cl.[4] F16K *31/122*
U.S. Cl. 137—505.12 5 Claims



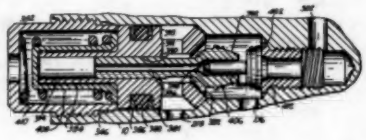
1. A stem pressure regulator for connection with the valve of a compressed gas cylinder, comprising a unitary inlet nipple having an inlet and an outlet and a central passage for conducting gases from the inlet to the outlet, the central passage including a circular bore, an annular seat formed in the body of the inlet nipple and surrounding said central passage at a plane transverse to the axis of the bore between the inlet and the outlet, piston means slidably disposed in the circular bore, the piston means having at a first end a seat area adapted to seal the annular seat, and at an opposite end having a face substantially larger than said annular seat, resilient spring means in said nipple urging said piston means away from said annular seat, second passage means for conducting fluid passing through said annular seat to said face, the piston means being arranged in a manner wherein the force of gas pressure on said face opposes the force of the spring means and closes said piston seat area against said annular seat when gas pressure on said face exceeds the gas pressure at the nipple inlet by a predetermined value, the nipple having a nose with a convex exterior surface at its inlet end, a generally circular exterior on a zone generally surrounding said annular seat and a shoulder downstream of said convex exterior surface and extending radially beyond said circular exterior, a coupling nut adapted to be assembled over said circular exterior, said nut having threads for coupling with a cylinder valve and a shoulder engageable with said nipple shoulder, the pitch diameter of the nut threads being greater than the diametral extent of the nipple shoulder, tightening of said nut threads on said cylinder valve causing abutment of said shoulders and sealing engagement of said nose with the cylinder valve, an adaptor on an outlet end of said nipple, said adaptor including means for coupling with separate compressed gas circuit components including a pressure regulator, said coupling means of the adaptor including coupling threads, the coupling means being of sufficient strength to support said pressure regulator in normal service and the nut including the threads thereof being of sufficient strength to support both said stem regulator and said pressure regulator in normal service.

4,898,206

COMPRESSION RELEASE RETARDER WITH VALVE MOTION MODIFIER

Zdenek S. Meistrick, Bloomfield, and Raymond N. Quenneville, Suffield, both of Conn., assignors to The Jacobs Manufacturing Company, Bloomfield, Conn.

Division of Ser. No. 120,825, Nov. 16, 1987, Pat. No. 4,838,516, which is a continuation-in-part of Ser. No. 872,494, Jun. 10, 1986, Pat. No. 4,706,624. This application Feb. 9, 1989, Ser. No. 308,837
Int. Cl.[4] F16K *15/06*
U.S. Cl. 137—512.3 10 Claims



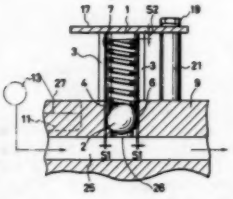
1. A control check valve for use in an hydraulic circuit comprising a body having a first bore formed therein, first and second passageways communicating with said first bore, a bushing seated in said first bore, said bushing having a second bore formed therethrough, a valve actuating pin closely fitted for axial movement in said second bore, a first valve seat seated in said first bore between said first and second passageways and having a third bore formed therethrough, said third bore having a larger diameter than the diameter of said valve actuating pin, a bushing retaining cap threaded into said first bore, a drive collar communicating with said bushing, a compression spring seated between said bushing retaining cap and said drive collar to bias said drive collar and said valve- actuating pin in an axial direction, a first valve mounted for axial movement by said valve actuating pin and spring means adapted to bias said first valve toward said valve seat.

4,898,207

OIL RELIEF VALVE FOR LUBRICATION SYSTEMS FOR INTERNAL COMBUSTION ENGINES

Noriyuki Ueki, Kakogawa, and Shigeru Nishimura, Kobe, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed Jan. 9, 1989, Ser. No. 294,671
Int. Cl.[4] F01M *1/00*
U.S. Cl. 137—539 3 Claims



1. An oil relief valve for a lubrication system for internal combustion engines, the system being of a type which has an oil line mounted in a bottom side of a crankcase, comprising a port bored in the bottom side of a valve chamber, a valve seat provided at an exit end of the port, said valve chamber extending upwardly from and connected to an upper end of the seat, the chamber having an inner circumferential surface, a vertically elongate sleeve member having a circular cross section and extending upwardly from the chamber, the sleeve member having an inner circumferential surface merged with the inner

surface of the chamber, vertical slits cut in the sleeve member, a valve plug mounted in the sleeve member and adapted to move along the inner circumferential surface of the sleeve member, and a coil spring mounted in a space defined in the sleeve member between the valve plug and a top portion of the sleeve, the spring having a free length smaller than the longitudinal distance of the space.

4,898,208

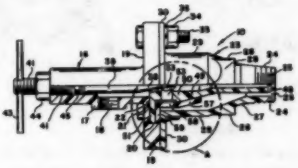
INJECTOR VALVE

George C. Nelson, York, Nebr., assignor to Cyclonaire Corporation, York, Nebr.

Continuation of Ser. No. 292,381, Dec. 30, 1988, abandoned. This application May 4, 1989, Ser. No. 347,418

Int. Cl.[4] F16K *15/14*

U.S. Cl. 137—614.2 **23 Claims**



1. A valve assembly, for use as an injector valve in a pneumatic conveying system for particulate solids, the assembly being adapted to be connected to a source of pressurized fluid, the assembly comprising:

a hollow inlet housing containing a chamber and having a first opening for receiving the shank of a valve spindle, said housing having a fluid inlet opening for introducing pressurized fluid into the inlet housing chamber;

a hollow discharge housing secured to said inlet housing and containing a chamber, said discharge housing having a discharge opening for discharging fluid from the discharge housing chamber;

a hollow valve seating element mounted in the chamber of said discharge housing, said seating element having at least one outlet opening passing from the hollow of said seating element to the outer surface of said seating element, said seating element having a hollow cylindrical inlet section containing a valve seat, and having a conical section forward of said hollow inlet section;

isolating means about said seating element for isolating the chamber of said inlet housing from the chamber of said discharge housing;

a valve spindle sealably contained within the chamber of said inlet housing, said spindle having a shank movably mounted in said first opening, and having a forward end proximate said valve seat and shaped to sealably mate with said valve seat;

means for selectively moving said spindle to engage and withdraw said shaped forward end relative to said valve seat to selectively close and open the valve; and,

a flexible elastomeric annular boot mounted on the outside surface of said valve seating element, said boot having a conical forward portion in contact with the outer surface of said seating element conical section, and having a cylindrical rearward portion in contact with the seating element cylindrical inlet section so that fluid entering the inlet housing when the valve is open passes through the valve seat, the hollow of the seating element, and the outlet opening of the seating element to stretch and flex the annular boot away from the outside surface of said seating element to allow flowing fluid to exit from the forward end of said conical forward portion of the boot and pass out of the valve assembly through the discharge opening.

4,898,209

SLIDING RECONSTITUTION DEVICE WITH SEAL

Brian D. Zbed, Round Lake Park, Ill., assignor to Baxter International Inc., Deerfield, Ill.

Filed Sep. 27, 1988, Ser. No. 249,747

Int. Cl.[4] F16L *37/28*

U.S. Cl. 137—614.04 **32 Claims**

1. A coupling device for establishing fluid communication between a first container and a second container comprising:

a first sleeve member including at a first end thereof, means for connecting and securing said first sleeve member to a first container;

a second sleeve member, so constructed and arranged that it receives a portion of the first sleeve, and operatively adapted for axial sliding engagement thereon, including means at one axial end thereof for releasably engaging and securing said second sleeve member to a second container;

piercing means located within the first and second sleeves and secured to one of the sleeves for providing fluid flow from the first container to the second container; and

a resilient seal means for sealing an end of the second sleeve member, located in said second sleeve member at said end adapted to be connected to said second container.

4,898,210

GAS-CYLINDER VALVE

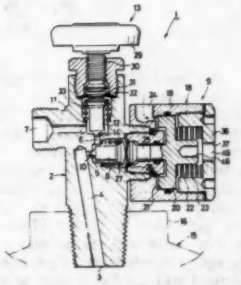
Jiro Nitta, Hyogoken, Japan, assignor to Kabushiki Kaisha Neriki, Hyogoken, Japan

Filed Jan. 4, 1989, Ser. No. 293,430

Claims priority, application Japan, Jan. 12, 1988, 63-2829

Int. Cl.[4] F16K *51/00, 31/44*

U.S. Cl. 137—614.19 **7 Claims**



1. A gas-cylinder valve adapted for securely controlling gas flow from a gas cylinder, comprising:

a one piece valve box having a gas inlet in communication with a gas outlet through a gas inlet passage, a gas supply valve chamber, a gas outlet passage and a metallic dia-

phragm sealing one end of said gas supply valve chamber within said valve box of said gas-cylinder valve;

a gas supply valve body movably supported in said gas supply valve chamber;

gas supply valve operation means for moving said gas supply valve body with respect to a first valve seat of the gas supply valve chamber to correspondingly open and close off said communication between said gas inlet and outlet passages;

said one piece valve box further including a protection valve chamber interposed downstream of said gas supply valve seat in said gas outlet passage within the valve box, said protection valve chamber being provided with a metallic diaphragm for sealing one end thereof and a movable protection valve body adapted to open and close off said gas outlet passage by controlled movement with respect to a second valve seat of the protection valve chamber;

spring means within each said gas supply valve chamber and said protection valve chamber for biasing said valve bodies in the direction of said metallic diaphragms; and

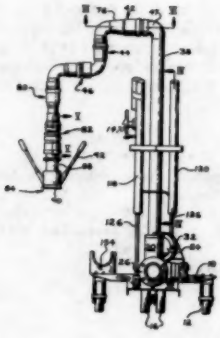
means to transmit valve operational forces to said diaphragms for opposing said biasing forces of said spring means and gas pressures acting on said diaphragms from within said valve chambers.

4,898,211

COUNTERBALANCED REFUELING ARM ASSEMBLY

Paul J. E. Fournier, Jackson, and Joseph F. Reinker, Jr., Parma, both of Mich., assignors to Aeroquip Corporation, Jackson, Mich.

Filed Nov. 21, 1988, Ser. No. 273,600
Int. Cl.[4] F16L *3/00*
U.S. Cl. 137—615 **6 Claims**



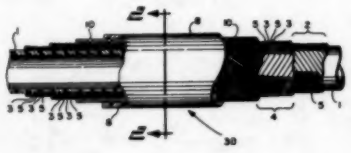
1. A counterbalanced refueling arm comprising, in combination, a supporting platform, wheels supporting said platform, an outboard caster assembly, said assembly including a caster wheel, a first swivel joint mounted on said outboard caster assembly having a substantially vertical axis of rotation, an inlet and an outlet defined on said joint, a fuel supply conduit communicating with said joint inlet, a second swivel joint mounted on said platform having a substantially horizontal axis of rotation, an inlet and an outlet, a rigid conduit interconnecting said first joint outlet with said second joint inlet establishing communication between said first and second joints, a substantially rigid arm conduit having an axis, an inner end affixed to and communicating with said second joint outlet and an outer end, said arm conduit being pivoted about said second joint axis within a substantially vertical plane, a first elbow swivel coupling having an inlet connected to said arm conduit outer end, an outlet and an axis of rotation transverse to said arm conduit axis, a second elbow swivel coupling having an inlet connected to said first coupling outlet, an outlet and an axis of rotation transverse to said first coupling axis, a third elbow swivel coupling having an inlet connected to said second coupling outlet, an outlet and an axis of rotation transverse to said coupling axis, and a nozzle connected to said third coupling outlet.

4,898,212

FATIGUE RESISTANT HOSE

Jerry R. Searfoss, Stow, and Bernard Keister, Aurora, both of Ohio, assignors to Eaton Corporation, Cleveland, Ohio

Filed Oct. 1, 1984, Ser. No. 656,202
Int. Cl.[4] F16L *11/04*
U.S. Cl. 138—130 **8 Claims**



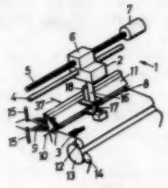
1. An improved flexible reinforced hose adapted for use in the conveyance of fluids under pressure, said hose comprising a core tube, at least one pair of oppositely helically wound inner and outer layers of reinforcing material disposed under tension about the core tube, and a protective jacket disposed about the reinforcement material, said reinforcement layers comprising a composite of synthetic fibers comprising a first synthetic fiber having a tenacity of from 12 to about 25 grams per denier with an elongation at break of about 2% to about 8% and a second synthetic fiber having a tenacity of from about 7 to 11 grams per denier and an elongation at break of from about 9% to about 17%, and said improvement characterized by said hose being provided with improved resistance to flexural fatigue as a result of said first and second fibers being disposed in alternating contiguous relationship to each other within each of said layers.

4,898,213

DEVICE FOR MENDING AND TRIMMING BROKEN WARP YARN

Yujiro Takegawa, Ishikawa, Japan, assignor to Tsudakoma Corp., Ishikawa, Japan

Filed Nov. 28, 1988, Ser. No. 276,857
Claims priority, application Japan, Nov. 26, 1987, 62-298805
Int. Cl.[4] D03D *49/00*
U.S. Cl. 139—1 R **4 Claims**



1. A device for mending and trimming broken warp yarn for a loom comprising:

a moving member supported above a woven cloth for movement widthwise along the woven cloth;

a yarn holding means mounted on the moving member to hold a free end of a mending yarn which has been tied to a broken warp yarn so that the free end of the mending yarn is extending substantially under tension;

a signaling device which generates a signal upon the detection of arrival of the free end of the mending yarn at a predetermined position;

a cutter for cutting the free end of the mending yarn extending from the woven cloth so that a predetermined length of the mending yarn remains on the woven cloth; and

a controller for controlling the moving member, the yarn holding means and the cutter for operation according to a predetermined control program, the moving member, yarn holding means, and cutter being controlled so as to automatically cut off the free end of the mending yarn extending from the woven cloth by a predetermined length from the woven cloth.

4,898,214

METHOD AND APPARATUS FOR REMOVING AN IMPROPERLY INSERTED WEFT THREAD FROM AN AIR-JET LOOM

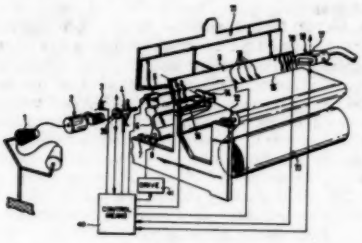
Dirk Lewyllie, Wervik; Jose Vangheluwe, Ypres; Bernard Pauwels, Roeselare, and Henry Shaw, Vleteren, all of Belgium, assignors to Picanol N. V., Ypres, Belgium

Filed Sep. 9, 1988, Ser. No. 242,123

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1987, 3730480

Int. Cl.[4] D03J *1/04*

U.S. Cl. 139—116 A 24 Claims



1. A method for removing a defectively inserted weft thread from a fabric fell in a fluid jet loom of the type wherein:

a length of weft thread normally is taken from a ready supply of weft thread and is inserted by being blown by a main jet nozzle into a first end of a shed formed from warp threads of the fabric,

the inserted weft thread is blown through the shed by auxiliary jet nozzles arranged along the shed,

the inserted weft thread is detected at a second end of the shed by a weft monitor located on the opposite side of the shed from the main nozzle, and

the inserted weft thread is beaten-up into the fabric fell and severed from the ready supply at a point adjacent the main nozzle, the method comprising the steps of:

preventing the severing of the weft thread when the weft thread is defectively inserted into the shed and not detected by the monitor;

stopping the operation of the loom in a position that forms the shed into which the weft thread is defectively inserted;

taking predetermined lengths of weft thread from the ready supply sequentially in several length segments, each segment being shorter than twice The width of the fabric, and blowing each segment through the shed together with the defectively inserted weft thread by using several sequential jet pulses from the main jet nozzle and the auxiliary jet nozzles.

4,898,215

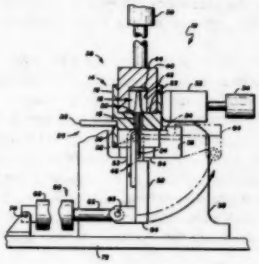
ELECTRICAL CONTACT BENDER

Gerald M. Jones, Titusville, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Feb. 9, 1989, Ser. No. 308,073

Int. Cl.[4] B21F *1/00*

U.S. Cl. 140—105 5 Claims



1. An apparatus for forming the contact leads of a connector block, said connector block comprising an electrically insulating body having a plurality of in-line apertures therein arrayed along an axis of said body and an electrical contact in each of said apertures, each of said contacts having a shoulder resting on a floor of said block and having a tail protruding therefrom, said apparatus comprising: means for engaging said block to hold said block firmly in a given position; means for engaging an upper portion of said contacts to apply pressure against said shoulder; tail engaging means for engaging said protruding tails of said contact; and means connected to said tail engaging means for causing said tail engaging means to pivot substantially away from the vertical a given amount and bend said tails substantially the same amount.

4,898,216

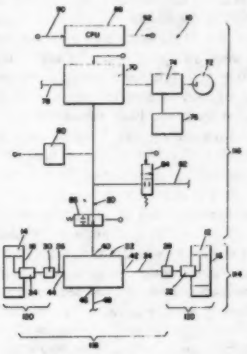
CTIS CONTROL SYSTEM AND METHOD FOR SENSING AND INDICATION OF INADEQUATE RATE OF CHANGE OF TIRE INFLATION PRESSURIZATION

Gary R. Schultz, and James A. Beverly, both of Kalamazoo, Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed May 25, 1988, Ser. No. 198,412

Int. Cl.[4] B60C *29/00*; G01N *7/00*

U.S. Cl. 141—4 12 Claims



1. A method for controlling a CTIS including sensing and reacting to conditions indicative of system faults causing inade-

quate tire inflation pressurization responses to commanded changes in selected tire inflation pressurization settings, said CTIS of the type having a plurality of operator selectable tire pressurization settings which are automatically achieved and maintained by the system, said method characterized by:

sensing operator selection of a desired pressure setting to be achieved and maintained by the system;

determining the maximum acceptable period for achieving the selected pressure setting from the current pressure setting;

beginning the appropriate sequence of inflation/deflation operations to achieve the selected pressure, said appropriate inflation/deflation operations comprising repeated cycles of pressure measurement and tire inflation/deflation, said maximum period measured as a number of cycles of pressure measurement and tire inflation/deflation; and

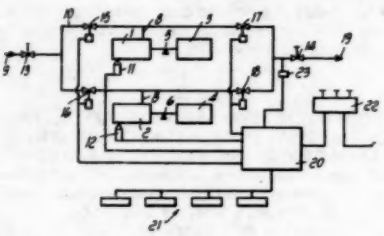
if the maximum acceptable period expires prior to achieving the selected pressure setting, discontinuing pressure measurement and adjustment operations, declaring a system fault and notifying the operator of said fault.

4,898,217

DEVICE FOR METERING THE MASS OF NATURAL GAS FOR FUELING MOTOR VEHICLES

Leonard Corbo, and Carlo Draghi, both of Via Savona 97, Milan 20144, Italy

Filed Apr. 4, 1988, Ser. No. 177,106
Int. Cl.[4] F17C *13/02*
U.S. Cl. 141—83 **2 Claims**



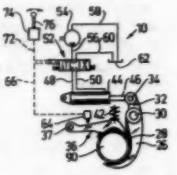
1. A gas mass metering device comprising a frame supporting at least two metering chambers, a counterweight associated to each of said at least two metering chambers, a yoke member disposed in between a respective one of said at least two chambers and said counterweight for balancing and supporting each respective one of said at least two metering chambers and counterweight, at least two load measuring cells, each of said at least two load measuring cells located underneath and supporting a respective chamber of said at least two chambers, a plurality of solenoid valves adapted to control the entrance and exit of gas in said at least two metering chambers, processor means for controlling said plurality of solenoid valves, each of said at least two metering chambers defining an enclosed volume with a single opening, and at least two flexible hoses each having two ends with the first end connected to said plurality of solenoid valves and the second end connected to said single opening in a respective one of said at least two metering chambers wherein said at least two flexible hoses are provided for filling gas in said at least two metering chambers and for removing gas therefrom wherein said chambers alternatively operate with a filling step in which one of said chambers is filled with gas and a fueling step in which the other of said chambers supplies gas contained therein.

4,898,218

DELIMBING DEVICE FOR A TREE

Stig Linderholm, Granglrde, Sweden, assignor to Granglrde Maskin AB, Granglrde, Sweden

Filed Jun. 2, 1989, Ser. No. 360,317
Claims priority, application Sweden, Jun. 6, 1988, 8802098
Int. Cl.[4] B27L *1/00*
U.S. Cl. 144—2 Z **4 Claims**



1. A delimbing device for a tree processing apparatus (10), comprising:

(a) a pair of curved gripping means (22,26) which are each provided with a limbing knife (24,28), for supporting and delimbing a peripheral section of a tree trunk movable in the longitudinal direction thereof relative to the gripping means;

(b) actuator means (44,46) operatively connected to said gripping means (22,26) and limbing knives (24,28) for adjusting the same relative to the tree trunk;

(c) an additional limbing knife (36) pivotally mounted on said device;

(d) means (42) for resiliently forcing said additional limbing knife (36) against the tree trunk for delimbing a remaining peripheral section thereof; and,

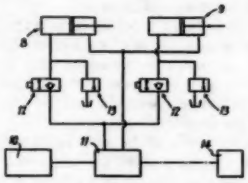
(e) a position sensor means (64) constructed and arranged to detect a displacement of a member (36,82), transverse to said longitudinal direction, following said remaining peripheral section of the tree trunk, and to emit a signal to make an adjustment of said actuator means (44,46) to change the amount of closing of said gripping means (22,26) and to thereby change the position of the tree trunk in the processing apparatus (10), each time a section of the trunk facing the additional limbing knife (36) has been displaced a predetermined distance in the direction of movement of the additional limbing knife (36).

4,898,219

WORKING HEAD FOR A TREE-SHAPING MACHINE

Jean-Pierre Pomies, Montargis, France, assignor to Association pour la Rationalization et la Mecanisation de l'Exploitation Forestiere - A.R.M.E.F., Paris, France

Filed Dec. 29, 1988, Ser. No. 291,519
Claims priority, application France, Dec. 31, 1987, 87 18480
Int. Cl.[4] A01G *23/02*
U.S. Cl. 144—2 Z **8 Claims**



1. In a working head for a tree-shaping machine including at least one shaping unit having at least one movably mounted blade and an actuating cylinder for applying said movable blade to the surface of the work, and means for driving work through the shaping unit, the improvement comprising

means for relieving the pressure in said cylinder during a starting phase of said driving means.

4,898,220

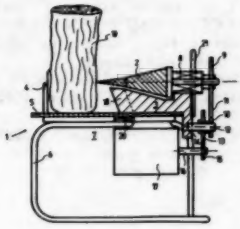
CONICAL SCREW AUGER MACHINE FOR SPLITTING A LOG OF WOOD

Gérard Maingueneau, Les Trois-Moutiers, France, assignor to Mecanique des 3 Moutiers, France

Continuation of Ser. No. 190,758, May 6, 1988, abandoned. This application Apr. 6, 1989, Ser. No. 334,782

Int. Cl.[4] B27L 7/00

U.S. Cl. 144—194 **5 Claims**



1. A wood splitting machine comprising a table having a metal surface for receiving a log which is to be split, a rotating threaded cone having a central axis of rotation which is parallel to the surface of said table, bearing means at the base of the cone for rotatably supporting said threaded cone, drive means for applying a rotational driving force through said bearing to turn said threaded cone, and a splitting wedge comprising a metal plate ahving a forward blade for penetrating and splitting a log, said plate having an elongation which lies along said axis of rotation, a bottom edge of said plate being fixed along its entire length to said surface of said table, a back portion of said plate being fixed to said bearing means for supporting said threaded cone, said back portion further having a member fixed to said drive means whereby said plate, and said table, said bearing means, and said drive means are integrated into a single mechanical unit which does not tend to separate or spring apart responsive to forces applied for splitting said log.

4,898,221

METHOD FOR LIMBING, BARKING AND CHIPPING, AND A DEVICE FOR UTILIZATION OF THE METHOD

Kjell-Anders Eriksson, Fiskgatan 10, Leksand, Sweden S-793 00

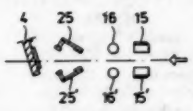
PCT No. PCT/SE87/00155, § 371 Date Sep. 27, 1988, § 102(e) Date Sep. 27, 1988, PCT Pub. No. WO87/05852, PCT Pub. Date Oct. 8, 1987

PCT Filed Mar. 25, 1987, Ser. No. 252,370

Claims priority, application Sweden, Mar. 27, 1986, 8601448

Int. Cl.[4] B27L 3/00, 11/00, 1/00

U.S. Cl. 144—340 **10 Claims**



1. A method of barking, limbing and chipping a log which includes the steps of displacing a log linearly towards a chipper by means of feed rollers, shearing branches from the log by means of knife-like means pressed against a peripheral surface of the log at a location preceding the feed rollers and removing bark from the log at a location following the feed rollers by barking means having barking members pressed against the peripheral surface of the log by centrifical force to remove bark from the log by a cutting operation.

4,898,222

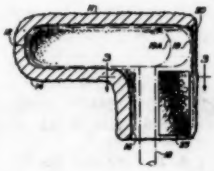
GOLF CLUB HEAD COVER

John H. Gaffney, 4429 E. Osborn, Phoenix, Ariz. 85018

Filed Jan. 12, 1989, Ser. No. 296,136

Int. Cl.[4] A63B 57/00; B65D 65/02

U.S. Cl. 150—160 **14 Claims**



1. A head cover for golf club irons or putters where the head is attached to the end of a shaft, said cover including in combination:

a first body portion made of flexible material and shaped to encase a golf club head having a toe and a heel, said first portion having a toe end and a heel end and being open on the heel end thereof;

a second body portion having first and second ends, with the first end thereof attached to said first body portion at the heel end thereof and at substantially right angles thereto for encasing at least a portion of the shaft of said golf club where it is attached to the head, said second portion being open on the second end and open on the side thereof adjacent the opening in said first portion to form a single continuous opening therewith in said cover; and

closing means comprising facing male and female fastener means located on on opposite sides of the inside of said second body portion adjacent the opening on the side thereof, for releasably closing the opening on the side of said second body portion to secure it around the shaft of a club, leaving the heel end of said first portion open when the head of such club is inserted into said first body portion, said shaft extending through the opening in the second end of said second body portion.

4,898,223

STIFF RUBBER COMPOSITION AND ARTICLES HAVING COMPONENTS THEREOF

Thomas J. Botzman, Stow, and Samuel P. Landers, Uniontown, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 30, 1989, Ser. No. 303,881

Int. Cl.[4] B60C 1/00, 15/00; C08L 51/04

U.S. Cl. 152—547 **14 Claims**

1. A rubber comprised of a sulfur cured blend of polyocte-

namer rubber, alkyl methacrylate grafted cis 1,4-polyisoprene rubber and at least one additional sulfur curable rubber se-

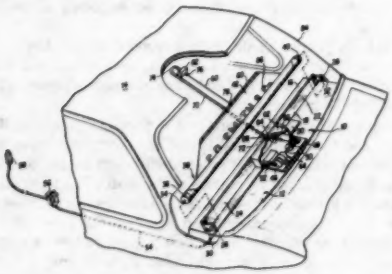
lected from natural rubber and synthetic rubber containing carbon-to-carbon double bond therein.

4,898,224

REAR WINDOW SHADE ASSEMBLY

Wesley L. Woodworth, 548 Wateroak Rd., Virginia Beach, Va. 23452

Filed Feb. 23, 1989, Ser. No. 314,521
Int. Cl.[4] E06B *9/20*
U.S. Cl. 160—310 **9 Claims**



1. A rear-window shade assembly for an automobile comprising:

a roll shade mechanism including a cylindrical drum with a thin shade wrapped thereabout, said drum having first and second support protrusions at opposite ends thereof, one of said support protrusions including a biasing means for returning said drum to a rolled up position when it is rotated away from the rolled-up position;

a base having a length at least as long as said drum of said roll shade, said base including first and second shade brackets spaced from one another approximately the length of the drum, said first and second shade bracket being respectively engagable with said first and second support protrusions, said base having a relatively flat bottom and being shaped to be positioned at an elongated shelf behind a back seat of an automobile with the drum of said shade being aligned with said shelf;

a crane arm extending upwardly from and being supported by, said base beside said shade mechanism, said crane arm including a guide means for guiding a cord extending from said base about an upper end portion of said crane arm back down to an outer end of said shade mounted on said shade drum while allowing said cord to move longitudinally, said crane arm including a means for allowing angular adjustment of the outer end thereof relative to said base so that said shade assembly can be mounted in a variety of car shops;

a winch mounted on said base, said winch including a motor and a spool rotated by said motor, said spool having a cord wrapped thereabout, an outer end of said cord extending along said crane arm about its outer end portion and extending back to, and being attached to, said outer end of said shade;

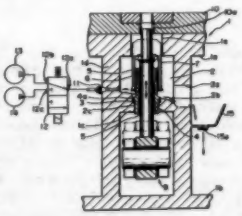
whereby, said motor assembly can be mounted in most cars and said motor can be driven to deploy and to retract said shade.

4,898,225

MOLD LUBRICANT EXHAUSTING APPARATUS FOR KNOCKING-OUT MECHANISM

Chieo Urata, Ishikawa, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

PCT No. PCT/JP88/00329, § 371 Date Nov. 30, 1988, § 102(e) Date Nov. 30, 1988, PCT Pub. No. WO88/07420, PCT Pub. Date Oct. 6, 1988
PCT Filed Mar. 31, 1988, Ser. No. 290,046
Claims priority, application Japan, Apr. 1, 1987, 62-49763[U]
Int. Cl.[4] B29C *33/44*
U.S. Cl. 164—158 **3 Claims**



1. A mold lubricant exhausting apparatus for a knockingout mechanism in which mold lubricant overflowed along a knock-out bar and accumulated in a bed is led into a reserving chamber formed around said knock-out bar to exhaust said mold lubricant through an exhaust port provided at said reserving chamber comprising:

a nozzle disposed at an end thereof in said reserving chamber;

an air pump connected to a base end of said nozzle for supplying air to said nozzle for forcibly exhausting said mold lubricant accumulated in said reserving chamber;

a water pump for supplying water to said nozzle for cleaning the mold lubricant accumulated in said reserving chamber; and

valve means for selectively connecting said water pump and said air pump to said nozzle.

4,898,226

IMMERSION NOZZLE FOR CONTINUOUS CASTING OF STEEL

Toshio Toshima; Tooru Kitagawa; Mikio Suzuki; Toshi Masaoka; Takashi Mori, and Kazutaka Okimoto, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

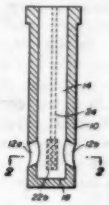
Filed May 26, 1988, Ser. No. 199,018
Claims priority, application Japan, Jun. 1, 1987, 62-134941; Feb. 25, 1988, 63-042720
Int. Cl.[4] B22D *11/10*
U.S. Cl. 168—415 **6 Claims**

1. An immersion nozzle for continuous casting of steel, comprising:

an immersion nozzle body having a bore for introducing molten steel supplied from a tundish into a continuous casting mold;

two exit ports located symmetrically about the vertical center axis of said immersion nozzle body at a lower portion of said immersion nozzle body to introduce the molten steel into the continuous casting mold;

gas blow-in inlets in an inwall of said immersion nozzle body, a center axis line of the gas blow-in inlets crossing, substantially at a right angle, a vertical plane passing through a line connecting the respective centers of the two exit ports;



said gas blow-in inlets have a height substantially equal to a vertical diameter across said exit ports, the top of said gas blow-in inlets being from 0 to 100 mm above the upper end of said exit ports in an inwall of said immersion nozzle body; and

gas blow conduits, each being connected respectively to one of said gas blow-in inlets.

4,898,227

PLANT TO CONVERT A METALLIC CHARGE INTO SEMIFINISHED PRODUCTS

Giampietro Benedetti, Campoformido, and Fulvio Fasano, Gorizia, both of Italy, assignors to Danieli & C. Officine Meccaniche SpA, Buttrio, Italy

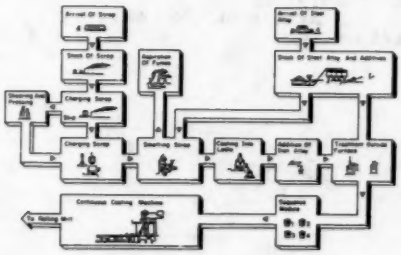
Division of Ser. No. 100,615, Sep. 24, 1987, Pat. No. 4,797,154. This application Oct. 24, 1988, Ser. No. 261,390

Claims priority, application Italy, Sep. 25, 1986, 83413 A/86

The portion of the term of this patent subsequent to Jun. 21, 2005, has been disclaimed.

Int. Cl.[4] B22D *11/00, 11/14*

U.S. Cl. 164—417 **6 Claims**



1. A system for the continuous conversion of metallic charge into semifinished products, comprising:

an electric furnace for metling the metallic charge, having electrodes; and

a preheating chamber for preheating the metallic charge, said chamber having first and second ends;

a burner communicating with said chamber between its first and second ends;

a terminal feed channel connected to said second end of said chamber, communicating with said furnace, for continuously feeding preheated charge materials into the furnace at a controlled and adjustable rate;

a continuously functioning transformer communicating with said furnace to supply electrical power to the electrodes of said furnace;

a tapping station, for tapping molten metal from said furnace;

a casting station for the continuous casting of the molten charge, said casting station comprising a tundish and a continuous caster, said tundish being communicable with said continuous caster to feed molten metal, at a controlled rate, to the continuous caster;

a refining station for refining molten metal, said refining station being positioned between said tapping and casting stations;

first and second ladles for containing molten metal;

a multi-functional manipulator for independently carrying the ladles between said tapping, refining and casting stations and for the simultaneous manipulation of said first and second ladles, comprising first and second rotatable arms, said arms being circumferentially and vertically traversable independently of each other, with said first arm carrying the first ladle and said second arm carrying the second ladle.

4,898,228

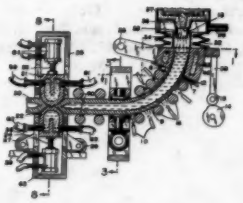
METHOD AND MEANS FOR SECTIONING CONTINUOUSLY CAST BILLET HAVING A MOLTEN CORE

Fred H. Wuetig, 7656 South Shore Dr., Chicago, Ill. 60649

Continuation of Ser. No. 425,335, Sep. 28, 1982, Pat. No. 4,815,520, which is a continuation of Ser. No. 200,936, Oct. 27, 1980, abandoned. This application Nov. 1, 1988, Ser. No. 265,564

Int. Cl.[4] B22D *11/126*

U.S. Cl. 164—460 **2 Claims**



2. The process of sectioning metal billet with a molten core comprising the steps of positioning a billet transversely extending across the path of travel of a ram having a blunt nosed configuration, and of closing said ram into contact with said billet and therethrough into contact with anvil means, thereby causing the walls of said billet to be pressed into contact and fused causing said billet to be sealed against leakage of said molten core as said walls are severed and said billet sectioned by said contact of said ram with said anvil means.

4,898,229

THERMOSTAT WITH INTEGRAL MEANS FOR DETECTING OUT-OF-PHASE CONNECTION OF A TWO-TRANSFORMER POWER SOURCE

Bernard T. Brown, St. Louis, Mo.; Donald E. Donnelly, Glen Carbon, Ill., and Bartholomew L. Toth, Crestwood, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Sep. 22, 1988, Ser. No. 247,492

Int. Cl.[4] G05D *23/00*

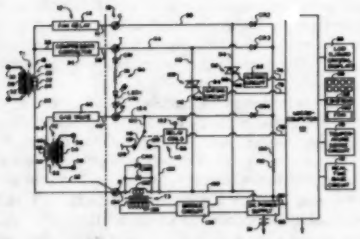
U.S. Cl. 165—11.1 **8 Claims**

1. In a thermostat for controlling operation of heating and cooling apparatus, which apparatus includes a plurality of low-voltage operated devices and transformer means for energizing the low-voltage operated devices,

a plurality of wiring terminals within said thermostat to

which the low-voltage operated devices and the transformer means are connected; and

circuit means connected between two of said terminals for detecting a voltage potential therebetween of approximately twice the normal operating voltage of said low voltage operated devices,



said detecting circuit means including a series connection of an LED and a voltage regulator, said voltage regulator being effective to break over and enable said LED to be illuminated when said voltage potential of approximately twice the normal operating voltage of said low-voltage operated devices exists.

4,898,230

AIR CONDITIONER WITH AN ENERGY SWITCH

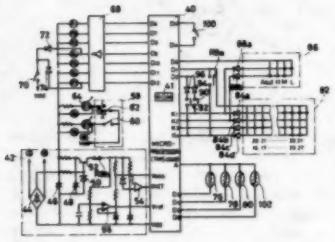
Yuji Tsuchiyama, and Masayuki Shimizu, both of Gunma, Japan, assignors to Sanyo Electric Co., Ltd., Osaka and Tokyo Sanyo Electric Co., Ltd., Gunma, both of, Japan

Continuation of Ser. No. 745,392, Jun. 14, 1985, abandoned. This application Nov. 17, 1987, Ser. No. 122,624

Claims priority, application Japan, Jun. 18, 1984, 59-125537; Jun. 18, 1984, 59-125539; Jun. 18, 1984, 59-91017[U]

Int. Cl.[4] F25B *29/00*

U.S. Cl. 165—12 **16 Claims**



1. An air conditioner with an energy saving switch, comprising:

a refrigerating system including compressor means, indoor heat exchanger means, expansion means and outdoor heat exchanger means connected in refrigerant flow relationship,

means for measuring a temperature of a room in which said indoor heat exchanger means is located to produce measured temperature data of the temperature of the room,

means for defining a temperature range from a first temperature to a second temperature which is higher than the first temperature so that a temperature to be produced by said refrigerating system can be set in said temperature range,

means for setting a temperature within said temperature range, which includes means generating set temperature data of the set temperature,

means for controlling an operation of said refrigerating system based on a comparison between the set temperature data generated by said means for generating temperature data and the measured temperature data produce by said temperature measuring means,

switch means,

means for changing said set temperature data in response to an operation of said switch means, said changing means including at least one of means for forcibly changing said set temperature data of the set temperature into temperature data corresponding to a third temperature only if the temperature set within said temperature range is within a first temperature subrange which exits between the third temperature and the second temperature when said refrigerating system is set in a heating mode and means for forcibly changing said temperature data of the set temperature into temperature data corresponding to a fourth temperature only if the temperature set within said temperature range is within a second temperature subrange which exists between the first temperature and the fourth temperature when said refrigerating system is set in a cooling mode,

said means for controlling including at least one of means for controlling an operation of said refrigerating system based on a comparison between said third temperature data and the measured temperature data produced by said temperature measuring means if the temperature set by said setting means is within said first temperature subrange in said heating mode and means for controlling an operation of said refrigerating system based on a comparison between said fourth temperature data and the measured temperature data produced by said temperature measuring means is the temperature set by said setting means is within said second temperature substrate in said cooling mode.

4,898,231

HEAT-PIPE SYSTEM AND METHOD OF AND APPARATUS FOR CONTROLLING A FLOW RATE OF A WORKING FLUID IN A LIQUID PIPE OF THE HEAT PIPE SYSTEM

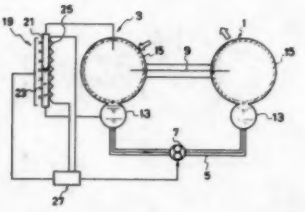
Yoshiro Miyazaki, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 913,389, Sep. 30, 1986, abandoned. This application Nov. 10, 1988, Ser. No. 285,311

Claims priority, application Japan, Sep. 30, 1985, 60-215140; Jun. 2, 1986, 61-125822

Int. Cl.[4] F28D *15/02*; F28F *27/00*

U.S. Cl. 165—13 **4 Claims**



1. A heat-pipe system which comprises:

an evaporator having a first capillary structure for evaporating a working fluid;

a condenser having a second capillary structure for condensing vapor evaporated in said evaporator into liquid condensate so as to return it to the evaporator through a liquid duct;

a vapor transport pipe communicating between vapor channels of said evaporator and said condenser for transporting the vapor evaporated in the evaporator;

a pump provided at the liquid duct for driving the working fluid therethrough;

sensor means for detecting the change in the amount of liquid in the capillary structure of the evaporator in accordance with the pressure difference between vapor pressure in the vapor channel and liquid pressure in the liquid channel of the evaporator; and

control unit means having a CPU, a ROM, and a RAM, connected between said pump and said sensor means for controlling the rotational speed of the pump in accordance with a detected signal from said sensor means so as to optimally control the amount of the liquid remaining in the capillary structure of the evaporator by controlling a flow rate of the liquid flowing through the liquid duct.

4,898,232

HEAT EXCHANGER AND PROCESS FOR PRODUCING THE SAME

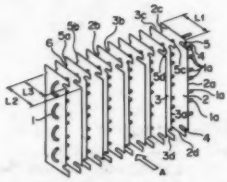
Izumi Ochiai; Masahiro Miyagi; Yoshio Nozawa, all of Tochigi, and Yukio Kitayama, deceased, late of Oyama, all of Japan (by Yuko Kitayama, Midori Kitayama, Takahisha Kitayama, successors), assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 7, 1988, Ser. No. 178,610

Claims priority, application Japan, Apr. 8, 1987, 62-84711

Int. Cl.[4] F28D *1/04*

U.S. Cl. 165—151 **10 Claims**



1. A heat exchanger comprising:

first and second types of fins stacked alternately with respect to each other;

each of first and second types of fins having notches in a direction perpendicular to a longitudinal direction of each said fin near longitudinal ends thereof;

widths of said first and second types of fins being equal at both longitudinal end portions of said first and second fins in outer areas defined by said notches thereof;

each of the first type of fins having a width at a portion between the notches greater than the width at the both longitudinal end portions thereof on the outer areas defined by said notches; and

at least one heat exchanger tube penetrating through the alternately stacked first and second types of fins.

4. A method of producing a heat exchanger comprising the steps of:

forming a plurality of rows of refrigerant-tube holes in a hoop;

forming lines of cutting which extend parallel to a direction of feed of said hoop at positions which are offset from the midpoint between adjacent rows of said holes, said lines of cutting having a length smaller than the longitudinal size of fins to be obtained;

forming slits or elongated holes in positions of said hoop to which the ends of said lines of cutting is to be extended, said slits or elongated holes having longitudinal axes extending in the direction crossing the direction of feed of said hoop;

cutting said hoop along a transverse line of cutting which extends in the direction crossing the direction of feed of said hoop past region between adjacent slits or elongated holes which oppose to each other in the direction of feed of said hoop, thus severing a group of fins having a plurality of fins of different types connected integrally;

stacking the successively severed groups of fins;

inserting refrigerant tubes into said holes in said fins and expanding said tubes so as to fix said tubes to said fins in the successive groups; and

cutting the stacked successive groups of fins at positions between adjacent rows of said holes and within the regions of said slits or said elongated holes.

4,898,233

HEAT EXCHANGE DEVICE USEFUL MORE PARTICULARLY FOR HEAT EXCHANGES BETWEEN GASES

Alain Grehier, Paris, and Alexandre Rojey, Garches, both of France, assignors to Institut Francais Du Petrole, Rueil-Malmaison, France

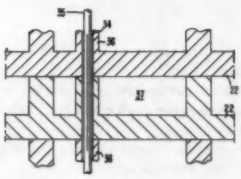
Division of Ser. No. 855,034, Apr. 23, 1986, Pat. No. 4,771,826.

This application Jul. 7, 1988, Ser. No. 216,466

Claims priority, application France, Apr. 23, 1985, 8506297

Int. Cl.[4] F28F *3/02, 3/08*

U.S. Cl. 165—166 **2 Claims**

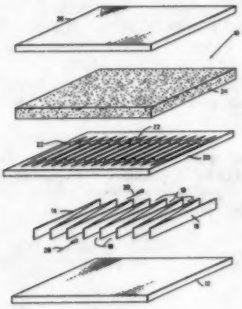


1. A device for the exchange of heat between first and second fluids, one being relatively hot and other being relatively cold, comprising a heat exchange zone and intake and discharge means connected to sources of each of said fluids for letting fluid in and discharging fluid from the heat exchange zone, wherein said heat exchange zone comprises at least one block formed by juxtaposition of a plurality of solid, rectangular, heat exchange-block-forming plates extending parallel with one another with each plate having opposed faces and with one face of each plate being planar; at least some of the plates being provided on only one face with crenelated spacing elements extending parallel with respect to one another and in spaced relation with one another on the same plate and with other of the plates having continuously extending spacers on only one face thereof with all continuously extending spacers extending in parallel from one plate to an adjacent plate; said plates being formed and disposed so that for any two adjacent plates one of the faces on one plate is provided with said crenelated spacing elements and one of the faces on the other of said plates is provided with said continuously extending spacers; the crenelated spacing elements and continuously extending spacers, each having flat surfaces abutting the planar face on the adjacent plate; said exchange zone further comprising first end plates disposed perpendicularly to the exchange-block-forming plates and extending parallel to the direction of extent of the continuously extending spacers, the first end plates being provided with openings for intake and discharge of the first fluid into and out of flow spaces provided by the crenelated spacing elements and second end plates disposed perpendicularly to the exchange-block-forming plates and perpendicular with respect to the direction of extent of the continuously extending spacers, the second end plates being provided with openings for intake and discharge of the second fluid into and out of flow spaces provided by the continuously extending spacers, said juxtaposed plates forming the exchange block being held clamped between two flanges by tie-rods formed from rods threaded at their ends passing through the assembly of plates through openings provided with sleeves distributed in spaced relation over the whole surface of said plate.

4,898,234
AIR HEAT EXCHANGER

Thomas McGovern, San Diego, Calif., and Robert B. Whitesides, Murrysville, Pa., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Aug. 19, 1988, Ser. No. 233,770
Int. Cl.[4] F28F 3/06, 3/12
U.S. Cl. 165—170 6 Claims



1. A heat exchange device providing a minimum pressure differential across the device and high heat transfer rates in the device, comprising:

a plurality of inlet and outlet channels for receiving and exhausting respectively the flow of a heat exchange medium directed to the inlet channels,

a plate-type structure located adjacent and in general parallel relation to the channels, said plate structure having a plurality of elongated orifices extending in the direction of and in registration with the inlet and outlet channels, each inlet and outlet channel having a corresponding orifice and,

a heat exchange panel disposed adjacent the orifice structure and on the side thereof opposite that of the channels such that the medium entering the input channels travels through the inlet channels and through the orifices corresponding thereto to the heat exchange panel and then from the panel through the orifices corresponding to the outlet channels and then through the outlet channels.

4,898,235
WELLHEAD APPARATUS FOR USE WITH A PLUNGER PRODUCED GAS WELL HAVING A SHUT-IN TIMER, AND METHOD OF USE THEREOF

David J. Enright, Breaux Bridge, La., assignor to Vernon E. Faulconer, Inc., Breaux Bridge, La.

Filed Nov. 7, 1988, Ser. No. 267,992
Int. Cl.[4] E21B 43/00
U.S. Cl. 166—64 9 Claims

1. Wellhead apparatus for attachment to a gas well in which a reciprocating plunger has a large diameter dimension fitting in the tubing for repetitive travel along the production tubing string extending from the bottom of the tubing in the well to the wellhead, the apparatus comprising:

(a) a transition tubing having an internal diameter size to fit about the plunger to contact the circumferential exterior of the plunger to guide the plunger for vertical movement therealong;

(b) a tee serially connected with said transition tubing and having a side flow port for removing well production fluid flow therefrom;

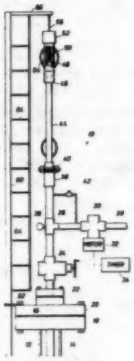
(c) a transverse shoulder above said tee;

(d) a lubricator extension having a mating shoulder contacting said transverse shoulder and adapted to be joined thereto by a removable shoulder engaging connector; and wherein said tubing string, transition tubing tee, and lubricator extension define a plunger pathway;

(e) an internally located and positioned plunger interceptor at the upper end of said lubricator extension;

(f) first and second lateral gas flow lines, said second line connected above said first flow line to prevent pressure cushioning in said lubricator extension as the plunger enters thereinto;

(g) a pivotal anchor suspending said lubricator extension above said shoulders and said anchor enables said lubricator extension to be moved to the side to open said tee and lubricator extension;



(h) wellhead located support means above the tubing string and aligned with the tubing string to receive the plunger from the tubing string into said transition tubing;

(i) a master valve serially connected above said transition tubing and having valve inlet and outlet means axially aligned and connected with said tee to enable the plunger to pass into said tee;

(j) a union sub and a union nut for clamping said two shoulders together; and

(k) resilient means mounting said interceptor for yielding in response to the plunger traveling through said lubricator extension in response to pressure drive moving the plunger upwardly against said interceptor.

4,898,236
DRILL STEM TESTING SYSTEM

David Sask, Calgary, Canada, assignor to Downhole Systems Technology Canada, Calgary, Canada

Filed Mar. 5, 1987, Ser. No. 22,128
Claims priority, application Canada, Mar. 7, 1986, 503613
Int. Cl.[4] E21B 49/08
U.S. Cl. 166—65.1 4 Claims

1. In a testing system for use in testing fluids in subsurface regions surrounding a wellbore, the testing system having an elongate housing insertable into the wellbore and a test flow channel formed in the housing for receiving test fluid from the test region and directing the test fluid through the interior of the housing, a test flow gating valve positioned in the test flow channel for regulating the flow of test fluid through the test flow channel, comprising:

means defining a test flow chamber in-line with the test flow channel;

a test flow valve member;

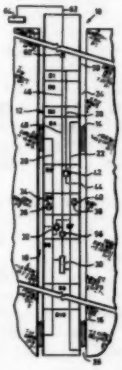
means mounting the test flow valve member in the test flow valve chamber for movement between an open position in which test fluids can flow through the test flow channel and a closed position in which test flow valve member obstructs the flow of fluids through the test flow channel;

biasing means for biasing the test flow valve member towards the closed position;

a fluid inlet channel formed in the housing and communicating with the exterior of the housing for receipt of wellbore fluid subject to ambient hydrostatic pressure and with the test flow valve member such that the ambient hydrostatic pressure can move the test flow valve member to the open position; and,

electrically-operable pressure gating valve means associated with the fluid inlet channel for regulating the application of the wellbore fluid under pressure to the test flow valve member, the pressure gating valve means comprising

a. means defining a pressure valve chamber, a high pressure port receiving the wellbore fluid subject to ambient hydrostatic pressure and communicating with the pressure valve chamber, a low pressure port communicating with the pressure valve chamber, and an outlet port for



placing the pressure valve chamber in communication with the test flow valve member;

b. a pressure valve member;

c. means mounting the pressure valve member in the chamber for movement between a high pressure position in which the pressure valve member obstructs the low pressure port and places the high pressure port in communication with the outlet port and a low pressure position in which the pressure valve member obstructs the high pressure port and places the low pressure port in communication with the outlet port;

d. pressure valve biasing means for biasing the pressure gating valve member towards the low pressure position;

e. sink means for receiving wellbore fluid from the low pressure port; and,

f. electrically-operable pressure valve displacing means for displacing the pressure valve member from the low pressure position to the high pressure position.

4,898,237

PROBE AND ITS MULTIDIRECTIONAL ANCHORING DEVICE IN A WELL

Christian Wittrisch, Rueil Malmaison, France, assignor to Institut Francais du Petrole, Rueil Malmaison, France

PCT No. PCT/FR87/00515, § 371 Date Aug. 24, 1988, § 102(e) Date Aug. 24, 1988, PCT Pub. No. WO88/05108, PCT Pub. Date Jul. 14, 1988

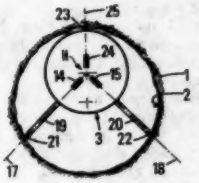
PCT Filed Dec. 23, 1987, Ser. No. 257,309

Claims priority, application France, Dec. 24, 1986, 86 18258

Int. Cl.[4] E21B *47/00*

U.S. Cl. 166—66 **10 Claims**

1. Device for anchoring a probe in a well, said probe having an axis disposed in parallel to an axis of the well and having a probe body means for supporting said device, the device includes at least two anchoring arms offset angularly with respect to each other relative to said axis of said probe and said arms disposed substantially at the same level as the probe, an outer wall portion of the probe body means next to a plane bisecting deployment planes of said anchoring arms, and being opposite the planes, is constructed so as to permit a firm direct



holding of said probe body means against walls of the well, and wherein said probe includes at least one direction-measuring element disposed in one of the deployment planes of said anchoring arms, said at least one measuring element being adapted to effect measurements in a direction of one of said deployment planes parallel to the probe axis and passing through one of the anchoring arms.

4,898,238

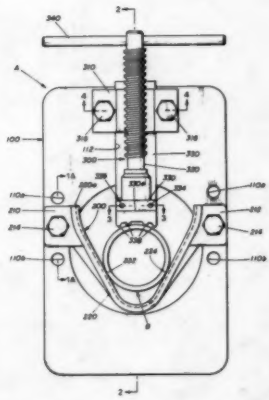
PIPE SUPPORTING DEVICE

Charles A. Grantom, 2712 Frank Rd., Houston, Tex. 77032

Filed Jun. 1, 1988, Ser. No. 201,488

Int. Cl.[4] E21B *19/10*

U.S. Cl. 166—75.1 **2 Claims**



1. A device for vertically suspending a tube in a well bore, comprising:

a base plate having a hole therethrough aligned with a well bore to allow the passage of a tube to be suspended in said well bore;

a gripping jaw;

a plurality of sets of jaw attachment means on said base plate spaced to enable selective placement of said jaw to accommodate a plurality of tubing diameters with at least one set of said attachment means on either side of said hole in said base plate;

said jaw having an internal substantially V-shaped gripping surface which is sized to provide two points of contact with said tube and which is releasably attached to said base plate by means of said attachment means on said base

plate and is positioned to receive said tube in the interior of said gripping surface;

a gripping head slideably attached to said base plate which contacts said tube on the opposite side from said two points of contact between said gripping jaw and the tube to urge said tube into contact with said gripping jaw;

a threaded shaft pivotably connected at one end to said gripping head to apply force thereto in the direction toward said gripping jaw;

a threaded block on said base plate, having half threads which mesh with threads on said threaded shaft, through which said threaded shaft is screwed to apply force to said gripping head;

said half threads on said threaded block meshing with said threads on said threaded shaft around only about half of its circumference, allowing disengagement of said threads when said threaded shaft pivots about said end which is connected to said gripping head;

an alignment channel in said base plate the longitudinal axis of which is parallel to the central axis of said half threads; and

an alignment bar attached at one end to said gripping head, which slides in said alignment channel to restrict said gripping head to linear movement.

4,898,239

RETRIEVABLE BRIDGE PLUG

Wayne O. Rosenthal, Fort Worth, Tex., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Feb. 23, 1989, Ser. No. 314,388

Int. Cl.[4] E21B *33/129*

U.S. Cl. 166—133 **3 Claims**

1. A retrievable bridge plug apparatus for use in a well conduit, comprising:

(a) body means having first and second ends and an interior passage formed in said body means, said body means having first and second openings that allow communication between said interior passage and the exterior of said apparatus, said body means first end being adapted to receive setting means for setting said apparatus in said well conduit;

(b) gripping means for engaging and gripping said well conduit, said gripping means being disposed around said body means, said gripping means being extendable from a retracted position to an extended set position wherein said gripping means can engage said well conduit;

(c) first and second extending means for extending said gripping means, said first and second extending means being slidably disposed on said body means, said second extending means being located between said first extending means and said body means second end, said second extending means being prevented from moving toward said body means second end by a first locking means, said first locking means being retained in position relative to said body means by retaining means;

(d) packing means for engaging and providing a seal against said well conduit, said packing means being disposed around said body means and located between said first and second openings, said packing means being extendable from a retracted position to an extended set position wherein said packing means can engage said well conduit;

(e) first shoulder means located on one end of said packing means and second shoulder means located on the other end of said packing means, said first and second shoulder means being slidably disposed on said body means so as to move independently of each other, said second shoulder means being coupled to said first extending means;

(f) cover means for sealingly covering said first opening, said cover means being slidably disposed on said body means;

(g) said gripping means and said packing means being extended by moving said first shoulder means toward said body means second end such that said second shoulder means moves said first extending means closer to said second extending means and said first shoulder means moves closer to said second shoulder means;

(h) said first shoulder means being prevented from moving toward said body means first end by second locking means which is located between said first shoulder means and said body means;

(i) said cover means being movable toward said body means first end to uncover said first opening, wherein pressure can be equalized, said cover means then being movable toward said body means second end;

(j) tubular means located in said body means and being responsive to movement of said cover means toward said second end so as to engage said retaining means, wherein said retaining means is removed from said first locking means and said first locking means is released and said second extending means can move toward said body means second end;

(k) said cover means being movable back toward said body means first end, wherein said cover means moves said body means in the same direction as said cover means causing said first shoulder means, said second shoulder means, and said first extending means to move away from said second extending means allowing said packing means and said gripping means to retract.

4,898,240

SYSTEM FOR MOVING A SET OF INSTRUMENTS AND A METHOD FOR MEASUREMENT AND/OR INTERVENTION IN A WELL

Christian Wittrisch, Rueil Malmaison, France, assignor to Institut Francais du Petrole, Rueil Malmaison, France

PCT No. PCT/FR87/00520, § 371 Date Aug. 31, 1988, § 102(e) Date Aug. 31, 1988, PCT Pub. No. WO88/05109, PCT Pub. Date Jul. 14, 1988

PCT Filed Dec. 30, 1987, Ser. No. 257,311

Claims priority, application France, Dec. 31, 1986, 86 18413

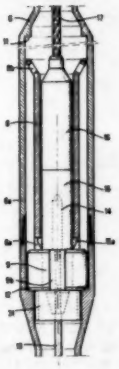
Int. Cl.[4] E21B *23/00, 47/00*

U.S. Cl. 166—250 **13 Claims**

1. A system for moving a set of measuring and/or intervention instruments in a well which is maneuverable remotely from the surface between a first position and a second position different from the first position, said system comprising a casing having one end located at the surface and another end located within the well and a body inside of which is placed support means for supporting said set of instruments, said body being connected to the another end of the casing and cooperating with said support means to provide movement of the support means relative to the body, said support means being limited in travel by means of two stops integral with said body and said support means being mechanically linked to said set of instruments by a connecting shaft; said system being devoid of

reversible locking means between said support means and said body.

12. A method for effecting measurement and/or intervention in a well by remote control from the surface with a set of instruments wherein a system of movement having two positions is employed, said system being devoid of reversible locking means between a support means for the set and a body secured to a lower end of a casing, wherein said casing and said set is introduced into the well, said set being connected to a matching socket by an electrical connecting cable, said socket being integral with support means, a connection shaft equipped with an electrical connecting element being adapted to be



connected to the support means and to the matching socket being introduced into the well, said system being in a second position, said first position being located along the casing between the second position and said surface, said method being further characterized by exerting a pull on a suspension cable attached to said support means to bring the support means into the first position, said connecting shaft being under tension, then by immobilizing said set of instruments relative to a well of the wall while maintaining the pull on said suspension cable, then releasing the tension from the connection shaft and bringing said support means into second position before carrying out the measurement and/or intervention.

4,898,241

METHOD AND DEVICE FOR TAKING MEASUREMENTS AND/OR CARRYING OUT INTERVENTIONS IN A WELL SUBJECTED TO HYDRAULIC COMPRESSION

Christian Wittrisch, Rueil Malmaison, France, assignor to Institut Francais du Petrole, Rueil Malmaison, France

PCT No. PCT/FR87/00521, § 371 Date Aug. 31, 1988, § 102(e) Date Aug. 31, 1988, PCT Pub. No. WO88/05110, PCT Pub. Date Jul. 14, 1988

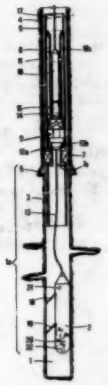
PCT Filed Dec. 30, 1987, Ser. No. 251,702

Claims priority, application France, Dec. 31, 1986, 86 18414; Dec. 31, 1986, 86 18417

Int. Cl.[4] E21B *34/14, 47/00*

U.S. Cl. 166—250 13 Claims

1. A method for carrying out measurements and/or interventions in a well having a first zone where hydraulic compression including hydraulic fracturing is effected and a second zone where the measurements and/or interventions are carried out, wherein a set on one or more measurement and/or intervention instruments is lowered into said well at the lower end of a casing, said compression zone being connected by the casing to hydraulic pressurization means, said set being connected to the surface by a cable located inside the casing and being mechanically isolated from the casing by an elastic link, characterized by controlling, at a point in the casing near said fracturing zone, any flow of fracturing fluid coming from or going to said fracturing zone, by means of a control element commanded at least partially by said cable from the surface,



said control element being located at a level higher than said set and said fracturing fluid passing through said control element before reaching the fracturing zone.

4,898,242

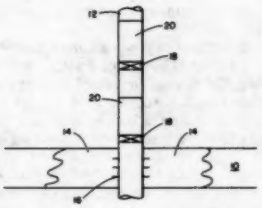
METHOD FOR SUSPENDING WELLS

Alfred R. Jennings, Jr., Plano, Tex., and Paul Shu, Princeton Junction, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 890,679, Jul. 30, 1986, Pat. No. 4,817,719. This application Apr. 11, 1988, Ser. No. 179,728

Int. Cl.[4] E21B *33/13*

U.S. Cl. 166—285 31 Claims



1. A method for shutting in a well which minimizes formation damage comprising:

(a) placing into a formation a liquid solution sufficient to establish fluid flow into said formation which solution also minimizes fluid retention;

(b) pumping a solidifiable gel mixture into the productive interval of a formation via a wellbore where said mixture comprises

(i) water,

(ii) 0.2 to 5.0 wt. percent of a cross linkable polymer having at least one functional group selected from a member of the group consisting of an amine, an amide, a hydroxyl, or a thiol group, and

(iii) 0.02 to 50.0 wt. percent of a partially methylated aminoplast resin which cross links with said polymer;

(c) causing said gel mixture to become a solid thereby forming a gel plug within said wellbore and a formation gel within said formation sufficient to withstand environmen-

tal formation conditions and pressures which cause hydrocarbonaceous fluids to flow into said wellbore from the formation areas near said wellbore;

(d) placing in said wellbore on top of said plug an amount of cement sufficient to isolate said productive interval when said cement hardens while being supported by said plug; and

(e) allowing said cement to set which set cement in combination with said gel plug is competent to exclude production fluids from said wellbore.

4,898,243

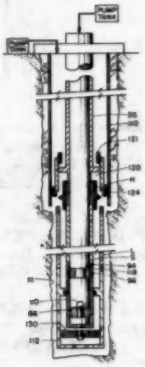
LINER AND DRILL PIPE ASSEMBLY

Hiram E. Lindsey, Midland, and Paul W. Cole, Odessa, both of Tex., assignors to Lindsey Completion Systems, Inc., Midland, Tex.

Filed Jan. 25, 1988, Ser. No. 147,533

Int. Cl.[4] E21B *23/00, 33/13*

U.S. Cl. 166—290 **7 Claims**



1. A method of cementing a liner in a well bore comprising the steps of:

making up sections of pipe to form a liner disposed in a well bore to a desired length of liner,

supporting the desired length of liner at the earth's surface while making up sections of drill pipe to form a desired string of drill pipe co-axially disposed within the desired length of liner where the desired string of drill pipe has a polished mandrel at its lower end and the desired length of liner has a sealing bore receptacle at its lower end which is disposed just above cementing equipment attached to the lower end of the desired length of liner,

when the polished mandrel is in position for sealing reception in the sealing bore receptacle, attaching a setting tool assembly to the desired string of drill pipe and attaching a liner hanger assembly with liner hanger slips to the desired length of liner, where the setting tool assembly and the liner hanger assembly are releasably interconnected while the polished mandrel is in the sealing bore receptacle, and where there is a hydraulically operated setting mechanism in the setting tool assembly for operating the liner hanger slips and a releasable pressure valve at the lower end of the desired string of drill pipe for use in developing hydraulic pressure for operating said hydraulically operated setting mechanism,

releasing the liner at the earth's surface and making up a supporting string of drill pipe attached to the setting tool assembly for lowering the co-axially disposed (telescoped) desired length of liner and desired string of drill pipe through the well bore to a desired liner location in the well bore,

hanging the liner in the well bore with liner hanger slips at a desired liner location in the well bore by applying hydraulic pressure to operate the setting tool and the step of applying an increased hydraulic pressure for releasing the pressure valve and opening the end of the drill pipe,

pumping a volume of cement slurry through the supporting string of drill pipe, the setting tool assembly and the desired string of drill pipe to a location below the sealing bore receptacle for injecting cement slurry into the annulus between the well bore and the desired length of liner, and

upon the trailing end of the volume of cement slurry reaching the lower end of the desired string of drill pipe, opening the interior of the desired string of drill pipe to the interior of the liner at a location above the sealing bore receptacle.

4,898,244

INSTALLATION OF DOWNHOLE PUMPS IN WELLS

John L. Schneider, Beech Wood Place, and Hugo M. Barcia, 18 Bremen Drive, both of West Hill, Skene, Aberdeenshire, United Kingdom

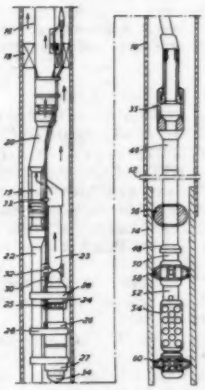
PCT No. PCT/GB87/00903, § 371 Date Aug. 12, 1988, § 102(e) Date Aug. 12, 1988, PCT Pub. No. WO88/04353, PCT Pub. Date Jun. 16, 1988

PCT Filed Dec. 14, 1987, Ser. No. 235,891

Claims priority, application United Kingdom, Dec. 12, 1986, 8629746

Int. Cl.[4] E21B *43/116, 43/00*

U.S. Cl. 166—297 **20 Claims**



1. A method of installing a downhole pump in a well comprising the steps of running a tubing-conveyed perforator assembly, including a perforating gun, and a downhole pump down the well simultaneously by means of a tubing string, and firing the perforating gun in underbalanced conditions while absorbing transmission of resultant mechanical shock through the tubing string.

4,898,245

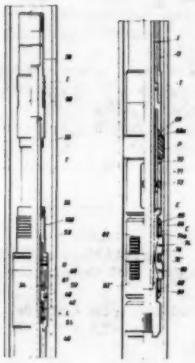
RETRIEVABLE WELL BORE TUBULAR MEMBER PACKER ARRANGEMENT AND METHOD

Britt O. Braddick, Houston, Tex., assignor to Texas Iron Works, Inc., Houston, Tex.

Continuation of Ser. No. 186,869, May 10, 1988, abandoned, which is a continuation-in-part of Ser. No. 7,786, Jan. 28, 1987, abandoned, which is a continuation-in-part of Ser. No. 912,320, Sep. 29, 1986, abandoned. This application Feb. 27, 1989, Ser. No. 314,158

Int. Cl.[4] E21B *23/08*

U.S. Cl. 166—387 **36 Claims**



1. A well bore tubular member retrievable packer arrangement for connection with either mechanically, hydraulically or wire line explosively actuated setting tool means retrievably supported on a setting string to sealably secure the packer arrangement with the well bore tubular member to communicate with a production string and which packer arrangement may be retrieved by a grapple tool supported on either coupled pipe, coiled pipe or a wireline comprising:

inner and outer tubular members;

said inner and outer tubular members each having an upper end;

connecting means adjacent the upper end of said inner tubular member for connecting said inner tubular member with the setting tool means;

said inner tubular member having a longitudinally extending, annular external surface adjacent its upper end;

adapter means supported by the retrievable setting tool means and surrounding said annular external surface on said inner tubular member;

securing means securing said inner and outer tubular members against relative movement as they are lowered into the well bore, said securing means releasable upon relative movement between said inner and outer tubular members;

packer means supported on aat least one of said tubular members and expandable into sealing engagement with the well bore tubular member upon relative longitudinal movement between said inner and outer tubular members;

slip means for engaging the well bore tubular member upon relative longitudinal movement between said inner and outer tubular members to secure the packer arrangement in expanded, sealed engagement with the well bore tubular member;

cooperating lock means on said inner and outer tubular members to lock said inner and outer tubular members in their longitudinally moved relationship to aid in maintaining said packer means secured in expanded, sealed engagement with the well bore tubular member;

disconnect means responsive to manipulation of the setting string for disconnecting the retrievable setting tool means and adapter from said inner tubular member whereby the setting tool means and said adapter may be withdrawn by the setting string to expose said external surface on said inner tubular member for sealably receiving the production string therearound; and

external grapple surface engaging means on the external surface of said outer tubular member for engagement by the grapple tool to retrieve the packer arrangement from the well bore tubular member.

7. A method of positioning a retrievable packer arrangement in a well bore tubular member by a setting string wherein the packer arrangement includes an inner tubular member connected with the setting string, an outer tubular member with external engageable release surface means adjacent its upper end and operable to release the set packer arrangement, packer means and slip means for sealably securing with the well bore tubular member, lock means to lock the packer arrangement in sealing relation with the well bore tubular member and which lock means can be unlocked by the external release surface means comprising the steps of:

releasably securing the inner and outer members against relative longitudinal movement;

manipulating the setting string to release the inner and outer members for relative longitudinal movement which moves the packer means and slip means into sealing and securing relationship with the well bore tubular member, positions the external engageable release surface means adjacent the upper end of the outer member for engagement and actuates the lock means to maintain the packer means and slip means in sealed and secured relationship with the well bore tubular member; and

releasing the setting string from the inner member and removing the setting string from the inner member for retrieval from the well bore to position the external engageable surface means adjacent the outer member upper end for engagement .

4,898,246

QUICK RELEASE VALVE FOR SPRINKLER HEAD

Armin Riedle, Rathingen, and Horst Zientek, Kaarst, both of Fed. Rep. of Germany, assignors to Total Walther Feuerschutz GmbH, Fed. Rep. of Germany

Filed Jun. 13, 1988, Ser. No. 206,029

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1987, 3722233; Jul. 22, 1987, 3724215; Aug. 6, 1987, 3726120

Int. Cl.[4] A62C *37/14, 37/10, 37/08*

U.S. Cl. 169—38 **16 Claims**

16. A release element for thermal and/or electrical release of a fire-protection system, in particular a sprinkler system, where the release element formed from glass is filled to its bursting with a liquid, wherein the release element (1) comprises a cylindrical glass tube (2) with at thin wall thickness (3), which is closed at its upper end by means of a glass plug (4) and which is provided at its lower end with a plug (5) and a filler opening (6), which is hermetically closed by melting in its lower part (8) after the filling of the bursting liquid into the inner chamber (7),

wherein the plugs (4, 5) are respectively provided on the outer side with a tension element which solidly span around the plugs;

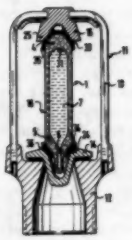
wherein the counter piece (15) and/or the closure piece (14) are formed as tension elements and where the counter piece (15) and/or the closure piece (14) respectively solidly surround the release element (1) with a collar (25);

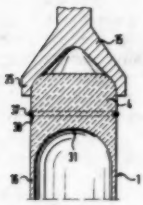
wherein the collars (25, 26) are extended up to the region of the cylindrical tube projection (10);

wherein the plugs (4, 5) are covered on their outer face with an elastic mass (35, 36), and where the pieces (4, 5) rest on the elastic mass (35, 36);

wherein the tension element is formed as a circular tension band (37) which is solidly clamped under tension in a groove (38) of the plug (4, 5);

wherein the tension band (37) is formed by an O-ring;
wherein the O-ring is comprised of a copper wire;





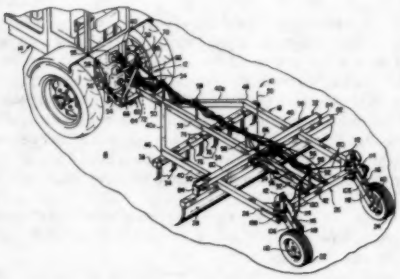
wherein the inner space (7) of the release element (1) exhibits at the upper end a semi-spherical shape (31) and at the lower end a funnel shape (32).

4,898,247

EARTH SCRAPER ATTACHMENT FOR A TRACTOR OR THE LIKE

Hendrix W. Springfield, Rte. #2, Box 250-1, Springtown, Tex. 76082

Filed Mar. 13, 1987, Ser. No. 25,730
Int. Cl.[4] E02F 3/76
U.S. Cl. 172—799.5 **6 Claims**



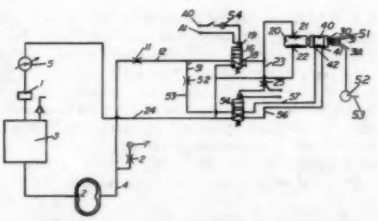
2. Earth scraping apparatus comprising:
a frame extending along an axis and having a forwardly disposed portion connectable to a vertically adjustable section of vehicle adapted to pull said frame, and a rearwardly disposed portion spaced apart along said axis from said forwardly disposed portion;
first and second frame support wheels;
connecting means for operatively connecting said frame support wheels to said rearwardly disposed portion of said frame on opposite sides of said axis;
wheel height adjustment means for selectively and independently adjusting the height of each of said frame support wheels relative to said frame;
earth scraping means, extending below said frame, for scraping the earth as said frame is moved by said vehicle; and
pivotal adjustment means for adjustably pivoting said earth scraping means relative to said frame about a generally vertically extending axis,
said earth scraping means including an elongated earth scraping blade disposed beneath said frame between said forwardly and rearwardly disposed portions thereof, and a blade support structure pivotally connected to said frame for rotation relative thereto about a generally vertically extending axis, said blade support structure being secured to said earth scraping blade,
said blade support structure being manually pivotable relative to said frame,
said pivotal adjustment means including locking means for manually locking said blade support structure in a selected manually pivoted position, and
said locking means including a chain secured to said frame, and a locking member carried by said blade support structure and insertable into a selected one of the links of said chain.

4,898,248

HYDRAULIC DEVICE

Owen R. Thompson, 1105 Colonel Anderson, Louisville, Ky. 40222

Filed Aug. 1, 1988, Ser. No. 197,520
Int. Cl.[4] B23Q 5/00
U.S. Cl. 173—12 **1 Claim**



1. Apparatus for tightening rotatable fastener including: a source of pressurized fluid, to supply fluid at selected pressure, first multiple rotating actuator means adapted to rotate shaft means; socket means connected to said shaft means to receive said fastener element to be tightened; pressure switch means adapted to operate said first multiple rotating actuator means and rotate said shaft until fluid pressure provided by said source of pressurized fluid reaches a first pressure less than said selected pressure; switch means operable in response to the attainment of said first pressure, to supply said presurized fluid to a second rotary actuator means and connect said second actuator means to said shaft means to rotate said shaft means through a portion of a full rotation at higher torque than provided by said first actuator means where said second rotary actuator means includes a tubular housing adapted to receive said shaft in generally central longitudinal alignment therein and vane means rotatable therein about said shaft between first and second limits in response to said pressurized fluid wherein ratchet means are provided to engage said vane and said shaft to rotate said shaft through a portion of a revolution when said vane is moved in a first direction and said vane is disengaged from said shaft when said vane is moved in a second direction; first and second pressurized fluid flow ports in said housing located so that admission of pressurized fluid to said first port and emission of said pressurized fluid from said second port rotate said vane in said first direction and admission of fluid

through said second port and emission of pressurized fluid from said first port rotates said vane in said second direction; valve means operable in response to said pressure switch between first valve position to normally admit pressurized fluid to said second port and hold said vane at said first limit and second position to admit said pressurized fluid to said first port to move said shaft in said first direction.

4,898,249

ROTARY ELECTRIC TOOL

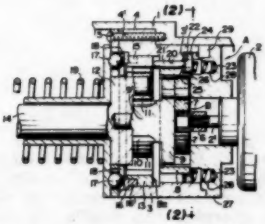
Toshitaka Okmori, Saitama, Japan, assignor to Olympic Co., Ltd., Saitama, Japan

Filed Jul. 5, 1988, Ser. No. 215,553

Claims priority, application Japan, Aug. 5, 1987, 62-120940[U]

Int. Cl.[4] B23Q 5/12; B25B 23/151

U.S. Cl. 173—12 **19 Claims**



1. A rotary electric tool comprising a differential gear mechanism mounted within a gear case projections formed on the outer peripheral surface of an internal gear of a final planetary gear mechanism in the different gear mechanism, said projections being brought into engagement with a projection-formed surface of a torque adjusting cam, a spring for biasing said torque adjusting cam toward said internal gear by means of balls interposed between said spring and said torque adjusting cam, the internal gear and the torque adjusting cam being changed in relative position axially by a reaction force of the internal gear, the rotation of an output shaft being changed over between high and low speed conditions according to an axial displacement of the internal gear.

4,898,250

HAND-HELD TOOL WITH SWITCHING MEANS FOR VARIABLE OPERATION

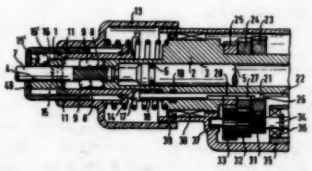
Anton Neumaier, Sennerbergstr.; Uto Plank, Albert-Sigismund-Str., and Gerhard Rumpp, Schornstr., all of Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein

Filed Dec. 17, 1987, Ser. No. 134,516

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1986, 3642976

Int. Cl.[4] E02D 7/02

U.S. Cl. 173—48 **27 Claims**



1. A hand-held tool comprises a housing having a front end through which a tool bit is inserted into an axially extending bore in a tool bit holder for receiving and holding different tool bits within said bore, and a probing means for determining the surface configuration of tool bits inserted into the holder for initiating a switching operation, wherein said probing means comprises at least one control element located within said housing in the region of said holder and being selectively displaceable transversely of the bore axis into the bore, a slide located within said housing coaxial with said bore, said slide arranged to abut against said control element in the axial direction of said bore when the control element is displaced laterally outwardly by a tool bit inserted into said holder and to extend axially over said control element when the control element extends radially inwardly of said slide into said bore, said probing means initiates the switching operation, one of mechanically, electrically or optically, said probing means comprises a switching member for selectively engaging one gear of a multi-stage gear train for the mechanically initiation of the switching operation.

4,898,251

EARTH BORING APPARATUS

Maxwell J. Clark, R.M.B. 7610, Reith Rd., Wangaratta, Victoria; Roy McMillan, and Frank J. Ogden, both of Wangaratta, all of Australia, assignors to Maxwell John Clark, Victoria, Australia

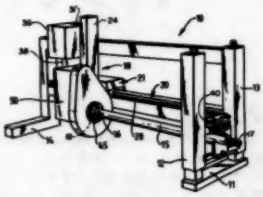
PCT No. PCT/AU87/00360, § 371 Date Aug. 23, 1988, § 102(e) Date Aug. 23, 1988, PCT Pub. No. WO88/03221, PCT Pub. Date May 5, 1988

PCT Filed Oct. 23, 1987, Ser. No. 240,234

Claims priority, application Australia, Oct. 23, 1986, 64335/86

Int. Cl.[4] E21B 44/00, 3/02

U.S. Cl. 175—27 **14 Claims**



1. An earth boring apparatus for driving a boring tool, the tool having a head for penetrating the earth and a longitudinally extending rotary drive shaft for advancing the head, the apparatus including a support frame, a carriage movably mounted to the support frame for movement therealong, said carriage being movable to advance the drive shaft and head relative to said frame to penetrate the earth and for retracting movement relative to the frame to enable a drive shaft extension to be fitted between the carriage and the drive shaft, a drive shaft engaging member associated with said frame and selectively operative to engage the drive shaft to inhibit rotation thereof thereby enabling the carriage to be retracted and the drive shaft extension to be fitted between the carriage and the drive shaft, said drive shaft engaging member including a roller for contacting the drive shaft, said roller having an axis of rotation extending generally transverse to the longitudinal direction of the drive shaft so that when said roller is engaged with said drive shaft rotational movement of the drive shaft is inhibited while longitudinal movement thereof is permitted.

9. An earth boring apparatus for driving a boring tool, the tool having a head for penetrating the earth and a longitudinally extending rotary drive shaft for advancing the head, the apparatus including a support frame, a carriage movably mounted to the support frame, said carriage supporting a drive shaft and a head attached thereto, said carriage being mounted

for advancing and retracting movement relative to the frame so as to enable a drive shaft to be driven and modified in length; advancing drive means for advancing the carriage and drive shaft, said advancing drive means including reaction means for sensing variations in earth resistance to penetration by the head, control means responsive to the penetration resistance sensed by said reaction means for controlling the operation of said advancing drive means to lessen the advancing force in response to increases in penetration resistance, said advancing drive means being mounted on the carriage and including a rotary drive bar for advancing the carriage, said reaction means including a mounting for said advancing drive means which is capable of limited pivoting movement relative to the carriage about an axis collinear with the rotational axis of the rotary drive bar in response to impeded movement of the carriage and continued operation of the advancing drive means, including rotary movement of the drive bar, said control means including a disabling switch operable in response to the limited pivoting movement of said reaction means to disable the advancing drive means.

4,898,252

CUTTING STRUCTURES FOR ROTARY DRILL BITS

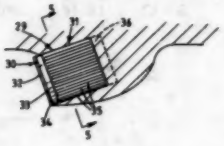
John D. Barr, Cheltenham, England, assignor to Reed Tool Company Limited, Gloucestershire, England

Filed Nov. 10, 1988, Ser. No. 269,780

Claims priority, application United Kingdom, Nov. 12, 1987, 8726541

Int. Cl.[4] E21B *10/56*

U.S. Cl. 175—379 **20 Claims**



1. A preform type cutting structure for a drag type rotary well drill bit, including a front layer formed of superhard material and having a rear surface and a front cutting face defining a cutting edge at one extremity of the layer of superhard material, and a backing structure formed of less hard material than said front layer, and at least a portion of the backing structure rearwardly of the cutting edge of the front layer being formed of a number of individual elements arranged one after another progressing crossways along the layer of superhard material, in a direction away from said cutting edge, and having means holding them in position such that, upon wear of the cutting edge and backing structure in use, the holding means of an element closest to the cutting edge and engaging the formation will eventually fail, causing detachment of that element from the backing structure, and thereby reducing the area of the backing structure in contact with the formation.

4,898,253

ELECTRONIC BALANCE FOR DOSING

Christian Oldendorf, Göttingen; Franz-Josef Melcher, Hardegsen, and Christoph Berg, Göttingen, all of Fed. Rep. of Germany, assignors to Sartorius GmbH, Fed. Rep. of Germany

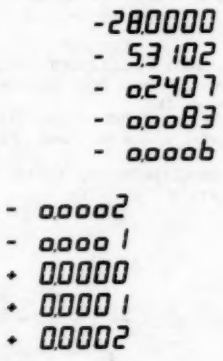
Filed May 30, 1989, Ser. No. 358,090

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1988, 3819075

Int. Cl.[4] G01G *19/62, 23/37*

U.S. Cl. 177—25.13 **2 Claims**

1. An electronic balance for dosing, with a measured value receiver (2), a digital signal processing unit (4,4'), a digital entry keyboard (13) for entering the theoretical value of a dosing, with a theoretical-weight memory (9) and with a digital display unit (5) with several positions after the decimal point, characterized in that switching means (8) are present which determine the highest-value decade in which a number



in the display (5) is not equal to zero and that these switching means (8) regulate the decoding (6) of the display in such a manner that all zeros to the left of this decade up to the units decade are represented as a small zero "o" whereas prezeros in the 10 decade, 100 decade, etc. are entirely suppressed in a known manner.

4,898,254

ELECTRONIC WEIGHING APPARATUS

Kensuke Fukui, Sumoto, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed May 19, 1989, Ser. No. 355,255

Claims priority, application Japan, Jul. 11, 1988, 63-172401; Jul. 13, 1988, 63-174616

Int. Cl.[4] G01G *3/14*

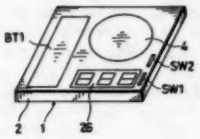
U.S. Cl. 177—210 C **29 Claims**

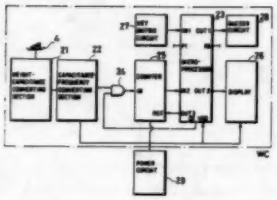
1. An electronic weighing apparatus for weighing a subject comprising:

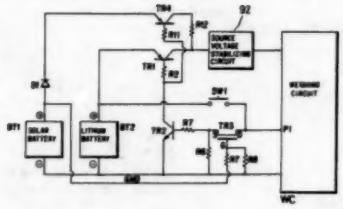
a weighing circuit which detects the weight of the subject by variation in capacitance, converts an oscillating output of an oscillating circuit corresponding to said variation into weight and displays the converted value on a display;

power supply means for supplying a driving current to said weighing circuit, said power supply means including a solar battery and a supplementary battery; and

switching means for effecting on-off control of electric current supply from said supplementary battery to said







weighing circuit in accordance with the output voltage of said solar battery.

4,898,255

PLANAR LOAD CELL

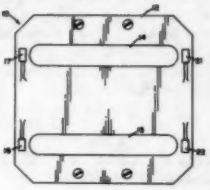
Ronald J. Gaines, Columbus, Ohio, assignor to Toledo Scale Corporation, Worthington, Ohio

Filed Jan. 17, 1989, Ser. No. 297,176

Int. Cl.[4] G01G *3/14, 3/08;* G01L *1/22*

U.S. Cl. 177—211 **8 Claims**

1. Weighing apparatus comprising a plate having longitudinal and lateral axes and a lateral dimension providing a desired torsional stiffness, a pair of strain gauges mounted adjacent each lateral edge of the plate, the strain gauges of each pair being spaced apart and aligned longitudinally, and slots in the plate extending laterally between the strain gauges of each



laterally opposite pair, said slots forming areas of stress concentration in the plate adjacent the strain gauges.

4,898,256

STAIR-CLIMBING WHEELCHAIR CARRIER WITH CRAWLERS

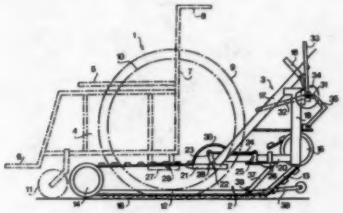
Max Lehner, Prambachkirchen, Austria, assignor to Sanwa Shiryo Manufacturing Co., Ltd., Tokyo, Japan

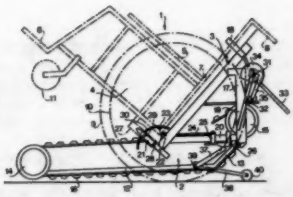
Filed Oct. 19, 1988, Ser. No. 259,651

Claims priority, application Austria, Oct. 20, 1987, 2764/87

Int. Cl.[4] B62B *5/02;* B62D *55/04*

U.S. Cl. 180—8.2 **23 Claims**





1. A crawler unit for coupling to a wheelchair and having a pair of power-driven tracks to be fitted between main wheels of the wheelchair, comprising:

a frame mounting said power-driven tracks;

an adapter for securing the wheelchair relative to said frame, said adapted including a coupling member for slidably mating with a complimentary coupling member on a wheelchair;

means mounting said adapter to said frame and permitting relative movement between said adapter and said frame;

lifting means connected to said frame and said adapter, and

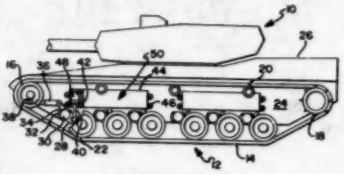
actuating means connected to said lifting means for selective operation of said lifting means by an occupant of a wheelchair secured by said adapter to permit said occupant to selectively lift the wheelchair and adapter relative to said frame and to lift the frame and power-driven tracks relative to the wheelchair and adapter.

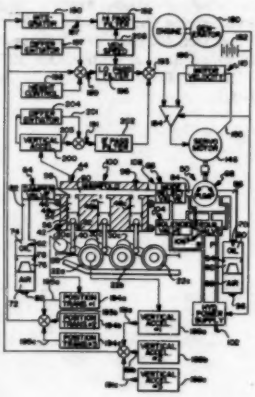
4,898,257

ACTIVE HYDROPNEUMATIC SUSPENSION SYSTEM

Jack M. Brandstadter, 1904 Cresthill Ave., Royal Oak, Mich. 48073

Filed Sep. 30, 1988, Ser. No. 251,676
Int. Cl.[4] B60G *17/04, 17/08;* B62D *55/112*
U.S. Cl. 180—9.1 **35 Claims**





1. An active hydropneumatic suspension system for controlling the position of a mass having a first motion and supported relative to a movable reference having a second motion independent of the first motion and the mass being isolatable from the movable reference and subject to external force comprising:

support means including a series arranged hydropneumatic spring for producing a predetermined force to support the mass, servopump and hydropneumatic accumulator for receiving fluid from said hydropneumatic spring to isolate the mass from the movable reference;

said servopump having a fixed displacement and a variable velocity and the hydropneumatic accumulator varying in oil volume in accordance with the operation of said servopump for isolating and stabilizing the mass with respect to the movable reference;

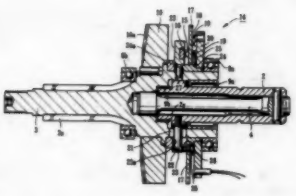
a control system including detectors for sensing the first motion of the mass and the second motion of the movable reference and operative to control the velocity of the servopump to transfer fluid energy between the hydropneumatic spring and the hydropneumatic accumulator by transferring equal and opposite flow of energy from said hydropneumatic spring to said hydropneumatic accumulator substantially equal to the flow of energy caused by motion of said movable reference to adjust the force supporting the mass so as to maintain the predetermined force of the hydropneumatic spring and to transmit substantially zero dynamic force to the mass by the second motion of the movable reference thereby to increase the isolation of the mass from the action of the movable reference and to increase the stabilization of the mass when subject to external force.

4,898,258

ELECTRIC POWER STEERING APPARATUS

Takeshi Obe; Yoshiaki Taniguchi, and Hiroshi Nishikiori, all of Saitama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Feb. 22, 1989, Ser. No. 314,180
Claims priority, application Japan, Feb. 29, 1988, 63-47110
Int. Cl.[4] B62D *5/04*
U.S. Cl. 180—79.1 **11 Claims**



1. An electric power steering apparatus comprising:

a torsion bar;

an input shaft on a steering wheel side and an output shaft on a wheel side, said input and output shafts being coupled to each other by said torsion bar so as to be pivotally displaced in relation to each other;

an electric motor, coupled to said output shaft, for applying an auxiliary steering force thereto; and

detecting means for detecting a relative, pivotal displacement of said input and output shafts, wherein

main portions of said input and output shafts are coaxially arranged, one of said shafts is a cylindrical member having an outer end in which said torsion bar is housed, an inner end of said one shaft is pivotally inserted in an opening of a cylindrical inner end of the other shaft,

said detecting means is arranged on an outer surface of an outer shaft of said input and output shafts at an overlap portion thereof,

displacement transmitting means for transmitting a displacement of said one shaft to said detecting means is formed in the inner end of said one shaft so as to extend through said other shaft, and

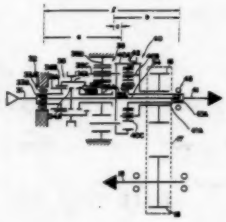
said detecting means can obtain a relative, pivotal displacement of said input and output shafts from a displacement of said one shaft transmitted from said displacement transmitting means.

4,898,259

FOUR-WHEEL DRIVE APPARATUS FOR AUTOMOTIVE VEHICLES

Yuuki Fujitani, Toyota, and Kouji Kawakami, Ciryu, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 29, 1988, Ser. No. 174,817
Claims priority, application Japan, Mar. 31, 1987, 62-76401; Mar. 31, 1987, 62-76402; Mar. 31, 1987, 62-76403
Int. Cl.[4] B60K 17/352
U.S. Cl. 180—250 13 Claims



1. A four-wheel drive apparatus comprising a planetary gear unit for shifting, a shift changeover unit, a differential planetary gear unit and a transfer unit for transferring rotating power from one of a rear-wheel slide and a front-wheel side to the other,

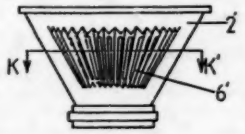
wherein said shift changeover unit is arranged on a side of said planetary gear unit directed to an input shaft of the four-wheel drive apparatus, a carrier of said planetary gear unit is connected to a main output shaft, said differential planetary gear unit is arranged between said planetary gear unit and said transfer unit, the differential planetary gear unit includes a differential planetary ring gear coupled directly to said carrier of the planetary gear unit, a differential planetary carrier coupled directly to drive means of said transfer unit and e differential planetary sun gear coupled directly to an output shaft, and a rotating force outputted by said planetary gear unit is transferred to said rear-wheel side and said front-wheel side.

4,898,260

LOUDSPEAKER MOUNTING WITH INTEGRAL BACK WAVE FILTER AND WAVE MODULATING PLATE OF SAME DESIGN

Jimmy Fang, Monterey Park, Calif., assignor to Peter Tsung Hoes Fei, Costa Mesa, Calif.

Filed Feb. 11, 1988, Ser. No. 154,202
Int. Cl.[4] H05K 5/00
U.S. Cl. 181—148 15 Claims



1. An improved loudspeaker located within a speaker cabinet, the loudspeaker comprising:

a speaker cone for generating sound waves; and

a filtering frame for reducing interference of said speaker cone from negative sound waves generated within said cabinet, said speaker cone being mounted on said filtering frame,

said filtering frame comprising:

a corrugated filter having a conically-shaped cross section with a plurality of apexes, said corrugated filter being substantially rigid and having a first and second side, and

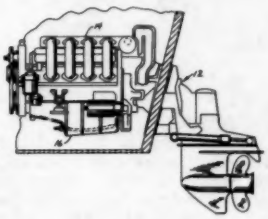
a plurality of apertures located on said first side at corresponding apexes of said corrugated filter.

4,898,261

WATER COOLED PLASTIC OIL PAN

Arvid E. Winberg, Fond du Lac, and James N. Gavrilos, Oshkosh, both of Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Apr. 10, 1989, Ser. No. 335,232
Int. Cl.[4] F01M 5/00
U.S. Cl. 184—6.22 13 Claims



1. An oil pan for an internal combustion engine, said oil pan comprising a plastic member having an upper lip for mating with said engine in sealing relation, sidewalls depending downwardly below said lip, a bottom extending between said sidewalls below said lip to provide a closed-bottom receptacle for holding engine oil, a plurality of reinforcing walls integrally formed along said sidewalls and increasing the mechanical strength of same to enable said plastic oil pan to support said engine when the latter rests on said oil pan during installation or repair procedures,

wherein said reinforcing walls are external to said oil pan and formed along the exterior surface of respective said sidewalls and comprise a plurality of struts extending laterally outwardly from respective said sidewalls and extending from said upper lip downwardly along said sidewalls,

wherein said sidewalls extend downwardly below said bottom of said oil pan such that when said oil pan and engine rest on a given surface, said sidewalls support and space said bottom of said oil pan above said surface such that the weight of said engine is supported by said sidewalls of said oil pan, and wherein said struts extend along the exterior of said sidewalls to the bottom of said sidewalls and are tapered to have their narrowest width at the bottom of said sidewalls and their widest width at the top of said sidewalls at said upper lip.

4,898,262

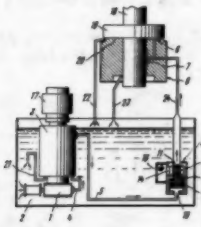
DECIVE FOR LUBRICATING HYDRODYNAMIC BEARINGS

Boris P. Gorodissky; Jury A. Lotts, and Lev N. Veretenov, all of Moscow, U.S.S.R., assignors to Moskovskoe Nauchno-Proizvod-stennoe Obiedinenie "Biophizpribor", Moscow, U.S.S.R.

PCT No. PCT/SU86/00114, § 371 Date Jun. 29, 1988, § 102(e) Date Jun. 29, 1988, PCT Pub. No. WO88/03612, PCT Pub. Date May 19, 1988
PCT Filed Nov. 10, 1986, Ser. No. 241,982
Int. Cl.[4] F01M 1/18, 11/10; F16C 1/24
U.S. Cl. 184—6.4 3 Claims

1. A device for lubricating hydrodynamic bearings, comprising a pump (1) for pumping oil from a tank (2) through a conduit (5) in communication with a delivery means which

supplies oil, with an operating or non-operating pump (1) to hydrodynamic bearings (8) on which a rotating shaft (18) is mounted, wherein the delivery means comprises a valve (9) having an inlet port (10), an outlet port (11), at least one auxiliary port (14) and a movable member (12) with an axial passage (13), through which the inlet port (10) is placed in communication with the outlet port (11) when the pump (1) is in operation, the valve (9) being mounted in the tank (2), so that at least the auxiliary port (14) is submerged in the oil, the movable member



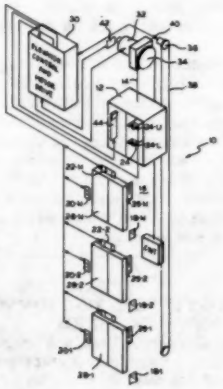
(12) with the pump (1) in operation is displaced to a first position, wherein the outlet port (11) is in communication with the inlet port (10) through the axial passage (13) through which oil is pumped into bearings (8) with the shaft (18) in rotation; and wherein the pump (1) is not in operation, the movable member (12) is shifted to a second position, wherein the outlet port (11) suction means at the bearings causes oil to be in communication with the auxiliary port (14) through which oil is sucked into the bearings (8) with the shaft (18) rotating.

4,898,263

ELEVATOR SELF-DIAGNOSTIC CONTROL SYSTEM

Bradley W. Manske, Moline, and John M. Weber, Milan, both of Ill., assignors to Montgomery Elevator Company, Moline, Ill.

Filed Sep. 12, 1988, Ser. No. 243,416
Int. Cl.[4] B66B 3/00
U.S. Cl. 187—133 **13 Claims**



1. In an elevator control system operable to control movement of an elevator car in a hoistway, a diagnostic system comprising:

means for sensing the operative status of a plurality of preselected elevator operational characteristics, each said operational characteristics having a preselected error level;

means coupled to said sensing means for monitoring the operative status of such characteristics to determine if any of said operational characteristics are in a preselected error status; and

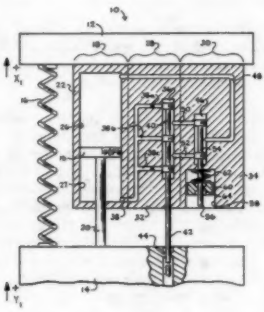
means responsive to said monitoring means for operating said control system to implement a desired action according to the error level of any operational characteristic which is in an error status as determined by said monitoring means.

4,898,264

SEMIACTIVE DAMPER WITH MOTION RESPONSIVE VALVE MEANS

Lane R. Miller, Fuquay-Varina, N.C., assignor to Lord Corporation, Erie, Pa.

Filed Apr. 3, 1989, Ser. No. 331,838
Int. Cl.[4] F16F 9/18
U.S. Cl. 188—275 **16 Claims**



1. A system for attenuating the transmission of vibratory and shock forces between a supported member and a supporting member, comprising:

a semiactive damper assembly interconnecting said members, said damper assembly having variable volume chambers containing hydraulic fluid and being operable in accordance with a preselected control policy based in part upon the sign of the absolute velocity of said supported member;

fluid circuit means interconnecting said chambers of said damper assembly for at times dictated by said control policy permitting relatively free flow of said fluid between said chambers, and for at other times dictated by said policy significantly restricting the flow of said fluid between said chambers;

said circuit means including a flow-controlling valve assembly responsive to changes in said sign of said absolute velocity of said supported member;

said valve assembly including first and second cooperating and relatively movable valve members, said first one of said valve members being connected to and movable with one of said supported and supporting members;

a body having a large inertia;

resilient means connecting said body to said first one of said valve members such that said body remains substantially stationary during movement of said one of said valve members; and

linkage means connecting said second one of said valve members to said body.

4,898,265

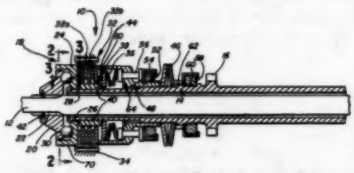
TORQUE LIMITER

Jeffrey D. Metcalf, Albion, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jan. 27, 1988, Ser. No. 148,889

Int. Cl.[4] F16D *67/00, 43/20*

U.S. Cl. 192—8 R **14 Claims**



1. A torque limiter, comprising:

an input shaft;

an output shaft coaxial with the input shaft;

a ball ramp torque transmitting device concentrically disposed relative to said shafts and including a first cam plate splined to the input shaft for rotation therewith and a second cam plate splined to the output shaft for rotation therewith;

spring means axially of the ball ramp device for normally preloading the cam plates;

a friction brake assembly including brake components axially disposed between the ball ramp device and the spring means and operatively associated with the output shaft and the second cam plate in such a manner that in the event of jamming relative rotation of the input and output shafts will effect axial displacement of the second cam plate to actuate the friction brake assembly; and

pin means extending axially through the brake components of the friction brake assembly for transmitting preloading spring force to the second cam plate,

said pin transmitting means having at least a portion that radially overlaps with at least one of the brake components.

4,898,266

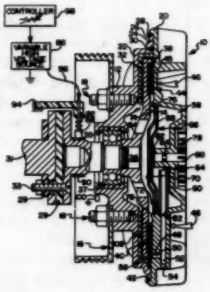
DOUBLE ELEMENT ELECTROVISCOUS FLUID CLUTCH

Wayne H. Garrett, Troy, and David A. Janson, Plymouth, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Apr. 27, 1989, Ser. No. 343,962

Int. Cl.[4] F16D *35/00, 43/25*

U.S. Cl. 192—21.5 **10 Claims**



1. An electroviscous fluid clutch comprising:

first and second members mounted for relative rotation about a common axis and defining cooperating shear surfaces forming an operating chamber therebetween;

means operative to circulate electroviscous fluid between said operating chamber and a storage chamber;

a passageway operative to interconnect said operating and storage chambers;

a source of high voltage potential; and

a plurality of electrodes in circuit with said source positioned to establish an electrostatic field within said passageway to selectively vary the characteristic viscosity of fluid flowing therethrough to modulate said circulating flow as a function of a sensed parametric input.

4,898,267

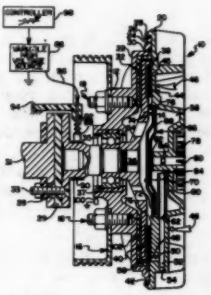
ELECTROVISCOUS FLUID CLUTCH

Wayne H. Garrett, Troy, and David A. Janson, Plymouth, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Apr. 27, 1989, Ser. No. 343,963

Int. Cl.[4] F16D *35/00, 43/25*

U.S. Cl. 192—21.5 **10 Claims**



1. An electroviscous fluid clutch comprising:

first and second members mounted for relative rotation about a common axis and defining cooperating shear surfaces forming an operating chamber therebetween;

means operative to circulate electroviscous fluid between said operating chamber and a storage chamber;

means operative to modulate said circulating flow as a function of a sensed parametric input;

a source of high voltage potential; and

a plurality of electrodes in circuit with said source positioned to establish an electrostatic field within said operating chamber to selectively vary the characteristic viscosity of fluid flowing therethrough.

4,898,268

PRINTER CIRCUIT BOARD POSITIONING APPARATUS

Yoslo Kamioka, Ota; Kazuhiro Hineno, Oizumi, and Tuneo Kanazawa, Oramachi, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Dec. 3, 1987, Ser. No. 128,026

Claims priority, application Japan, Dec. 10, 1986, 61-190065[U]

Int. Cl.[4] B65G *21/20*

U.S. Cl. 198—345 **6 Claims**

1. A printed circuit board positioning apparatus comprising:

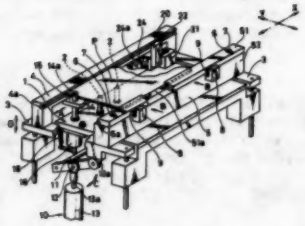
a table having a support member for supporting a printed circuit board;

guiding/transporting means on said table for guiding the printed circuit board as the circuit board moves in a flow direction over the support member and for transporting the circuit board onto the support member, said guiding/-transporting means being formed for holding both end faces of the printed circuit board in a direction perpendicular to the flow direction;

first positioning means for positioning the printed circuit board in the direction perpendicular to the flow direction thereof by moving said guiding/transporting means;

a reference member; and

second positioning means for urging the printed circuit board towards the reference member in the flow direction of the circuit in response to a relative to approaching motion of the circuit board guiding/transporting means



toward said table before the printed circuit board is supported by said support member on said table, said first positioning means including an urging mechanism for moving said guiding/transporting means and which changes position in response to the circuit board urging in a direction perpendicular to the flow direction of the printed circuit board, said urging mechanism consisting of a plurality of rotary rollers, in each of which an eccentric position of a rotating shaft can be adjusted.

4,898,269

CLAMPING DEVICE FOR PALLETS

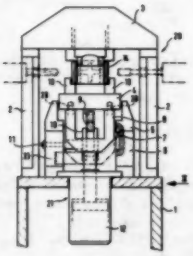
Helmut Hannig, Rainau-Buch, Fed. Rep. of Germany, assignor to Alfing Kessler Sondermaschinen GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 65,851, Jun. 24, 1987, abandoned. This application Oct. 5, 1988, Ser. No. 253,877

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1986, 3621604

Int. Cl.[4] B65G 47/00

U.S. Cl. 198—346.1 **20 Claims**



1. An apparatus for positioning and clamping workpieces in a processing station, comprising:

(a) a processing station having a clamping device including alignment means for complimentarily engaging and aligning a workpiece to be processed in the processing station;

(b) a workpiece pallet for transporting a workpiece to said processing station, said workpiece pallet including a workpiece carrier for carrying the workpiece during transport to said processing station with the workpiece displaceably placed on the workpiece carrier so as to provide sufficient play to the workpiece being carried to enable the workpiece to engage and be aligned by said alignment means at the processing station;

(c) feed device means for conveying the pallet, workpiece carrier and workpiece to said processing station; and

(d) means at said processing station for lifting the pallet with the workpiece thereon so as to press the workpiece against and align the workpiece with the alignment means and thereby clamp the workpiece between the pallet workpiece carrier and the alignment means, for processing the workpiece in the processing station.

4,898,270

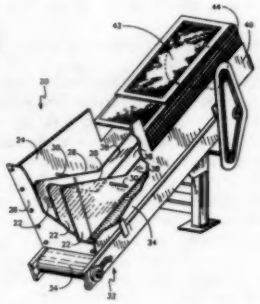
APPARATUS FOR ALIGNING AND TRANSPORTING CONTAINERS

Larry K. Hopkins, Lakewood; Gregory J. Fischer, and David G. Green, both of Wheatridge, all of Colo., assignors to Golden Aluminum Company, Lakewood, Colo.

Filed Sep. 18, 1987, Ser. No. 98,479

Int. Cl.[4] B65G 47/24

U.S. Cl. 198—396 **19 Claims**



1. An apparatus for aligning and transporting containers, comprising:

(a) a hopper, said hopper having at least two substantially parallel stationary dividers forming hopper lanes for aligning containers about their longitudinal axes, said dividers having top surfaces, said top surfaces lying in substantially parallel vertical planes and declining from an end wall of said hopper, wherein each top surface has an angle of declination different from that of each adjacent top surface;

(b) conveyor means positioned under at least a portion of said dividers for transporting said aligned containers in a first direction to a first conveyor means end;

(c) movable deflector means spaced a first distance over said inclined conveyor means, said first distance equal to at least the width of said containers for deflecting any of said containers having at least a portion extending above said inclined conveyor means by more than said first distance, wherein said deflected containers are deflected down said inclined conveyor means; and

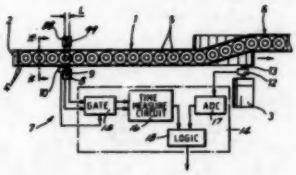
(d) wherein the center of said movable deflector means is approximately aligned with said first conveyor means end so that misaligned containers contacted and supported by adjacent leading aligned containers having a portion extending above said inclined conveyor means by slightly more than said first distance can be aligned as said aligned containers drop from said first conveyor means end prior to deflection of said misaligned containers by said movable deflector means.

4,898,271

METHOD AND DEVICE FOR SIGNALING OF A BACK-UP ON A CONTAINER CONVEYOR

Hans Schlosel, Pforzheim, Fed. Rep. of Germany, assignor to Krones AG Hermann Kronseder Maschinenfabrik, Neutrabling, Fed. Rep. of Germany

Filed Oct. 10, 1985, Ser. No. 787,321
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1984, 34383581
Int. Cl.[4] B65G 47/26
U.S. Cl. 198—444 6 Claims



1. A device for detecting a back-up of bottles being transported on a conveyor, said device comprising:

means for projecting two beams from one to the other side of the path in which said bottles are transported on said conveyor through a measuring zone, said beams being directed at a level such that the beams are interrupted by a region in said bottles between the widest portion of the bottle and the mouth of the bottle,

detectors arranged on said other side of the conveyor in line with said beams, respectively, with a predetermined spacing between them, said detectors each producing a timing signal coincident with the leading edge of a moving bottle interrupting the beams consecutively,

signal processor means having input means for said signals and using the timing signals and spacing between beams to provide a signal representative of the transport speed of said bottles,

means for producing a signal representative of the speed of the conveyor and means supplying said signal to said processor means,

said processor means responding to existence of a predetermined relationship between said bottle speed and said conveyor speed signals by producing a signal indicative of a back-up.

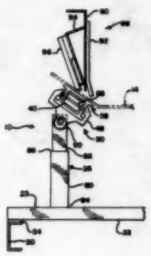
4,898,272

CONVEYOR BELT SUPPORT MECHANISM

R. Todd Swinderman, Kewanee; Michael A. Bowman, Sheffield, both of Ill., and Larry J. Goldbeck, Camanche, Iowa, assignors to Martin Engineering Company, Neponset, Ill.

Filed Apr. 20, 1989, Ser. No. 340,870
Int. Cl.[4] B65G 15/60
U.S. Cl. 198—841 9 Claims

1. A conveyor belt support mechanism comprising at least one vertical support disposed beneath said conveyor belt, at least one mounting member connected to said vertical support, at least one slider bar having a plurality of wear surfaces, each of which are adapted to be positioned in sliding supporting engagement under said conveyor belt, fastening means releasably securing said slider bar to said mounting member whereby said slider bar is readily removable and repositionable such that when one of said wear surfaces becomes worn beyond an acceptable limit said slider bar can be repositioned to place another wear surface in supporting engagement with said conveyor belt, and adjustment means associated with said mounting member and said vertical support for varying the position of said mounting member and said associated slider



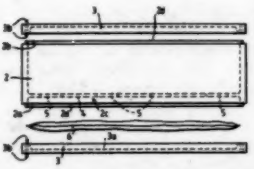
bar with respect to said conveyor belt so as to compensate for wear to said wear surfaces.

4,898,273

PACKING FOR TRANSPORT OF PRODUCTS GIVING OFF MOISTURE

Cato Kristiansen, Rena, Norway, assignor to Renaco AS, Rena, Norway

Filed Jan. 21, 1986, Ser. No. 821,032
Claims priority, application Norway, Feb. 21, 1985, 850698
Int. Cl.[4] B65D 81/26
U.S. Cl. 206—204 5 Claims



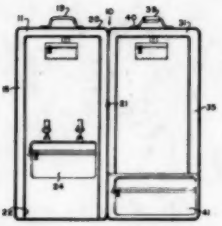
1. A packing assembly for storage and transport of fresh food products which give off moisture, such as fresh iced fish product and fresh meat products and the like comprising a box opening upwards and made from a liquid tight material with an upper lid, side and end walls, and a double bottom comprising an upper bottom member with drainage openings and a lower bottom member, and a moisture absorbent provided in a chamber between said bottom members where said absorbent is kept in place and is protected against mechanical strain, the upper bottom member of the box being raised in relation to lower edges of the side and end walls of the box to form said chamber having its opening facing fownward for insertion of a moisture absorbent, and the lower bottom member consisting of a chamber lid for closing said chamber with its content of absorbent, and said chamber lid being identically shaped with the upper lid for the box, and said side and end walls having lower and upper rims, and said lids being provided with an annular groove at one end face for engagement with the lower and upper rims of the box side and end walls.

4,898,274

DOUBLED HANGING GARMENT BAG

Derwin E. Stout; Robert C. Wilcox, and Charles A. Peloquin, all of Memphis, Tenn., assignors to The Trojan Luggage Company, Memphis, Tenn.

Filed Aug. 26, 1987, Ser. No. 91,399
Int. Cl.[4] A45C 5/12, 13/00, 13/10; B65D 85/18
U.S. Cl. 206—289 8 Claims



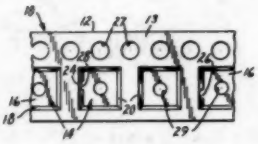
1. A foldable, doubled, hanging garment bag comprising:
an elongate, rectangular first garment bag formed by
a first outer side member having a predetermined generally rectangular configuration and top and bottom ends,
a first inner side member having a predetermined generally rectangular configuration congruent with that of said first outer side member,
a first peripheral gusset member joined with each of said first side members about the periphery thereof for defining with said first side members a contained volume for receiving garments,
first handle means secured to a face of said first outer side member opposite said first inner side member at a location approximately midway the height of said first outer side member for accommodating handling of said first garment bag in a folded condition, and
a first elongate row of closure teeth encircling the periphery of said first inner side member adjacent the junction of said first inner side member and said first gusset member; and
an elongate, rectangular second garment bag formed by
a second outer side member having a predetermined generally rectangular configuration congruent with that of said first outer side member and having top and bottom ends,
a second inner side member having a predetermined generally rectangular configuration congruent with that of said second outer side member,
a second peripheral gusset member joined with each of said second side members about the periphery thereof for defining with said second side members a contained volume for receiving garments,
second handle means secured to a face of said second outer side member opposite said second inner side member at a location approximately midway the height of said second outer side member for accommodating handling of said second garment bag in a folded condition, and
a second elongate row of closure teeth encircling the periphery of said second inner side member adjacent the junction of said second inner side member and said second gusset member,
said first and second elongate rows of closure teeth being sized and spaced for locking engagement thereof, and
slide means mounted on one of said first and second elongate rows of closure teeth for joining said teeth into a closed chain and thereby for joining said first and second garment bags together with said first and second inner side members adjoining and juxtaposed and said first and second handle means exposed on opposite faces of said joined garment bags,
whereby said first and second garment bags may be joined for handling as a single garment bag having two separate contained volumes for receiving garments.

4,898,275

NON NESTING COMPONENT CARRIER TAPE

Tom Skrtic, Eau Claire, Wis., and Timothy J. Juntunen, Stillwater, Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Mich.

Filed May 25, 1989, Ser. No. 356,526
Int. Cl.[4] B65D 73/02, 85/30
U.S. Cl. 206—330 12 Claims



1. A unitary flexible carrier tape comprising a strip like portion defining a top surface for said tape, and wall portions defining a multiplicity of similarly shaped pockets spaced along said tape and opening through said top surface, said wall portions comprising:
bottom wall portions,
side wall portions extending between said strip like portion and said bottom wall portions, said side wall portions including:
a majority of angled parts disposed at included angles of slightly greater than a right angle with respect to the top surface of said strip like portion so that said angled parts of said side wall portions converge toward the bottom wall portions, and
a minority of generally normal parts extending between said strip like portion and said bottom wall portions, said generally normal parts being disposed at included angles significantly closer to a right angle with respect to the top surface of said strip like portion than the included angles between said adjacent angled parts and said top surface to provide, with projecting parts of said bottom wall portions adjacent said generally normal parts, anti nesting shoulders for restricting entry of said side wall portions defining the pockets in one wrap of the carrier tape on a reel into the pockets in the wrap of carrier tape beneath it.

4,898,276

STORAGE AND DISPENSING BOX FOR SMALL COMPONENTS

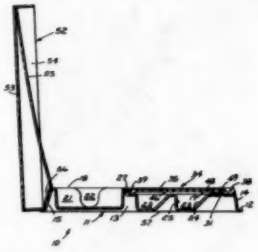
Evangelos G. Georgakis, Downey, Calif., assignor to Unitek Corporation, Monrovia, Calif.

Filed Dec. 23, 1987, Ser. No. 137,812
Int. Cl.[4] B65D 83/10
U.S. Cl. 206—369 8 Claims

1. A storage and dispensing box, comprising:
a base having generally parallel upper, intermediate and bottom surfaces joined by common spaced-apart sidewalls, the intermediate surface being positioned between the upper and bottom surfaces, being generally planar, and defining a plurality of open-top and downwardly closed cavities extending toward the bottom surface, said base having an elongated channel formed in at least one of said sidewalls, and
a closure panel having an elongated edge slidably engaged with the channel of the base to be movable into open and closed positions which respectively expose and cover the

cavities, the closure panel having a bottom surface which rests on the base intermediate surface;

one of the base intermediate and panel bottom surfaces defining a projecting button, and the other of said surfaces defining a groove extending in the direction of elongation of said channel and said edge, and in the direction of panel



movement, said groove receiving the button, the groove having an end with a socket which receives the button when the panel is in the closed position, the groove having a shallowed portion adjacent said end and defining a detent whereby the panel is retained in the closed position and can be opened only by forcing the detent past the button.

4,898,277

COVER-LOCKING DEVICE FOR A VIDEO TAPE CASSETTE

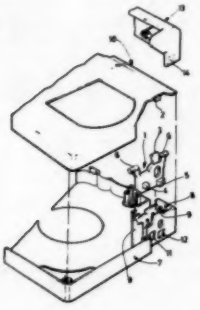
Jae K. Ko, and Kyung H. Chung, both of Chungchongnam, Rep. of Korea, assignors to SKC Limited, Rep. of Korea

Filed Jan. 17, 1989, Ser. No. 298,344

Claims priority, application Rep. of Korea, Aug. 18, 1988, 88-13473

Int. Cl.[4] B65D *85/672*

U.S. Cl. 206—387 **1 Claim**



1. A cover-locking device for a video tape cassette including a half-down, a half-up, and a chamber formed at a front portion of said half-down at one end thereof, said cover-locking device comprising a cover-locking pin having a lock-releasing protrusion and an engaging protrusion, and a pair of shafts laterally protruding from opposite upper sides of said cover-locking pin for pivotably supporting said cover-locking pin on support members disposed in said chamber; said cover-locking device further comprising;

a push member integrally formed on an inner surface of said half-up of said tape cassette; and

an operating member formed on an upper portion of said cover-locking pin and protruding higher than said pair of shafts, said operating member being in contact with said push member when said cover-locking pin is supported on said support members.

4,898,278

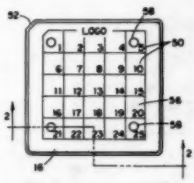
STORAGE CONTAINER

Richard A. Leoncavallo, Pittsford; Linda J. Kover, Rochester, and Gregory R. Phillips, Penfield, all of N.Y., assignors to Nalge Company, Rochester, N.Y.

Continuation of Ser. No. 938,187, Dec. 5, 1986, abandoned. This application Sep. 19, 1988, Ser. No. 212,269

Int. Cl.[4] B65D *85/20*

U.S. Cl. 206—443 **10 Claims**



1. A plastic container for holding an array of vials or other like articles comprising:

a base portion having a bottom wall, an upstanding peripheral wall extending from said bottom wall terminating at its upper end in a mating ridge portion;

a divider disposed within and secured to said base portion, said divider being spaced from said bottom wall of said base, said divider having a pluralityof openings each capable of receiving a vial or similar or other like articles, said divider having a retaining wall disposed around its periphery, said divider having on its upper surface indicia permanently affixed thereto and associated with each opening for identifying positions of each of said openings;

a top cover for placement on said base portion having a top wall, a peripheral outer wall extending downwardly from said top wall terminating at its lower end in a rim portion for mating with said ridge portion of said base portion and said outer retaining wall of said divider;

means for orienting said container so that said indicia on said divider is properly oriented for the user.

4,898,279

WARP-FREE PAPERBOARD SLAT

Kent A. Lianemann, Cincinnati, Ohio, assignor to Shippers Paper Products Company, Loveland, Ohio

Continuation-in-part of Ser. No. 946,858, Dec. 29, 1986, Pat. No. 4,771,885. This application Dec. 30, 1987, Ser. No. 139,472

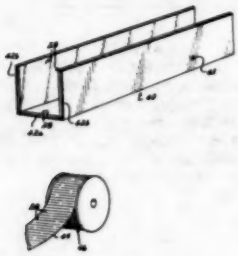
Int. Cl.[4] B65D *65/02, 81/02*

U.S. Cl. 206—586 **2 Claims**

1. A structural channel for use in protecting the edge of a product to be packaged or shipped comprising a sheet of paperboard and a central and two side slats adhered thereto, said slats comprising a plurality of sheets of paperboard laminated to each other and the paper laminate being folded upon itself along a fold line with the facing sheets being adhered together and having a rounded edge along the fold line.

2. A wrapping material for use in protecting product to be packaged or shipped comprising a sheet of paperboard and a plurality of paperboard slats adhered thereto in substantially edge abutting relation, said slats comprising a plurality of sheets of paperboard laminated to each other and the paper laminate being folded upon itself along a fold line with the facing sheets being adhered together and substantially overlap-

ping one another to cause opposed planar faces along where it is laminated to itself, one of said opposed planar faces being



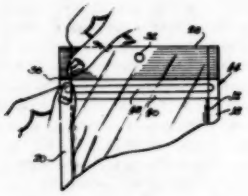
laminated to said sheet of paperboard, and said slat having a rounded edge along the fold line.

4,898,280

RECLOSABLE BAG

Heinz F. Runge, Niles, Ill., assignor to Kraft, Inc., Glenview, Ill.

Division of Ser. No. 186,886, Apr. 27, 1988. This application Mar. 1, 1989, Ser. No. 317,447
Int. Cl.[4] B65D *33/30*
U.S. Cl. 206—604 2 Claims



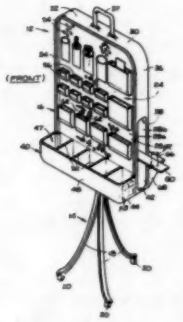
1. A reclosable bag comprising:
opposing walls having top and bottom edges extending between a pair of side edges;
a marginal seal of preselected width joining the top, bottom and side edges of said walls to form a product-receiving cavity therebetween, the marginal seal having an inner edge adjacent the cavity and an outer free edge;
a tear line along said walls between the side edges thereof, located adjacent the marginal seal of said top edge;
weakening means in the marginal seal of at least one side edge extending from a free edge of the marginal seal and formed along an edge of said tear line;
a metal strip segment on one side wall having a top edge spaced from the tear line and a pair of opposed ends adjacent each side edge terminating between the inner and outer edge of the marginal seal located thereat; and
a strip of sealing tape cooperating with said metal strip segment to encapsulate said metal strip segment, said sealing tape having a top edge adjacent said tear line so as to prevent migration of the tearing of said walls during opening of the reclosable bag into major portions of the walls; and
said opposing walls being flexible so as to be rollable about said metal strip segment, and said metal strip segment being bendable so as to reclose the opening in the bag formed by tearing the walls along said tear line, upon rolling the walls about the metal strip segment.

4,898,281

BEAUTICIAN'S CADDY

Sophia Cherry, 2539 W. 77th St., Chicago, Ill. 60652

Filed Dec. 27, 1988, Ser. No. 289,750
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—13 12 Claims



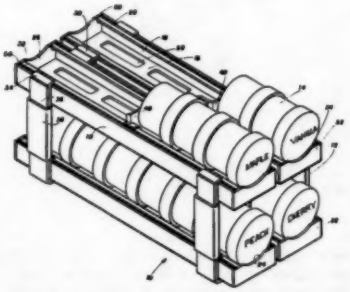
1. A beautician's caddy comprising,
a stand,
an upright panel unit having broad faces on opposite sides thereof, mounted on and carried by the stand, and positioned entirely thereabove,
the caddy being easily movable by a user, and
means detachably and demountably supporting beautician's articles on the panel in an arrangement distributed thereon in which each article is accessible to the user, independently of the others, by merely grasping and withdrawing it.

4,898,282

MERCHANDISE DISPLAY RACK

Rodney B. Hawkinson, 1919 Valencia St., Napa, Calif. 94558, and Julius A. Sarto, 383 N. Autuma St., San Jose, Calif. 95110

Filed Jul. 22, 1988, Ser. No. 223,101
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—49.1 8 Claims



1. A display rack for merchandise in containers comprising:
a slideway having a bottom panel, narrow upright side panels and inwardly directed side rails at the tops of said side panels;
said slideway having a front end and a rear end;
said side rails being spaced apart a distance to support a container;
a pair of pulleys at the front end of said slideway, each disposed adjacent one of said side panels;

an elongated, stretchable, thin, coiled tension spring secured at opposite ends thereof to the rear ends of said slideway;

said tension spring extending forwardly along one of said side panels, around both of said pulleys and back along the other of said side panels so that any extending and contracting movements of said tension spring are facilitated by said pulleys

a push plate;

a pair of outwardly disposed channel-like slide members carried on said push plate and slidably received on said side rails; and

mutually engageable stop means on said push plate and the front end of said slideway;

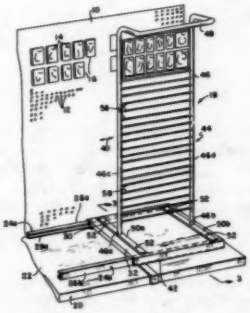
the portion of said tension spring between said pulleys extending slidably across the back of said push plate and free of attachment thereto.

4,898,283

MOVEABLE DISPLAY RACK ASSEMBLY

Ted Kingsford, Memphis, Tenn., assignor to Plough, Inc., Memphis, Tenn.

Filed Sep. 6, 1988, Ser. No. 241,161
Int. Cl.[4] A47F 7/00
U.S. Cl. 211—57.1 **26 Claims**



1. A movable pegboard display assembly for use with a fixed display wall and a stationary base positioned in front of and at a lower position with respect to the fixed display wall, said movable display assembly comprising:

upright rack means for supporting a plurality of articles thereon, said upright rack means including a lower end and an unsupported and unguided upper free end extending for a substantial height of said fixed display wall, said upright rack means including pegboard means for supporting the plurality of articles thereon;

trolley means for movably supporting said lower end on top of said stationary base; and

means for fixedly securing said lower end of said upright rack means on said trolley means.

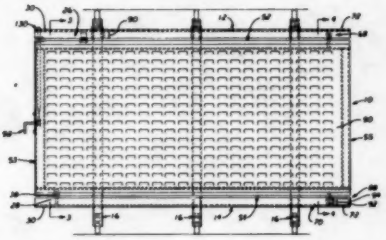
4,898,284

STORAGE DEVICE

Richard F. Arens, 12110 Timberlake Rd., Riverview, Fla. 33569

Filed Jul. 8, 1988, Ser. No. 222,061
Int. Cl.[4] B60R 11/06
U.S. Cl. 211—162 **15 Claims**

1. A storage device comprising a stationary support frame having a storage carriage slidably mounted thereon, said stationary support frame includes an upper and lower substantially horizontal support member each having a first and second support track formed thereon held in spaced relationship by a plurality of substantially vertical support members and an upper guide and a lower support element affixed to said upper and lower substantially horizontal support members respectively, said storage carriage includes a substantially vertical storage panel to support a plurality of storage containers thereon affixed between an upper and substantially horizontal carriage member having a first carriage track formed thereon and a lower substantially horizontal carriage member having a first and second carriage track formed thereon formed thereon and an upper and lower carriage element affixed to said upper and lower substantially horizontal carriage members respectively, said upper guide and lower support elements are disposed within said first carriage track of said upper and lower substantially horizontal carriage members respectively and said upper and lower carriage elements in offset relationship relative to each other in the vertical plane are disposed within said first and second support track of said upper and lower substantially horizontal support member respectively to limit lateral and rotational movement of said storage carriage as said storage carriage is moved between a retracted and extended position relative to said stationary support frame.

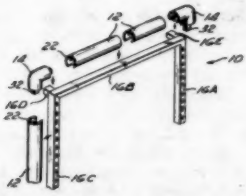


4,898,285

MERCHANDISE RACK COVERING SYSTEM

Frank P. Field, 854 Napoli Dr., Pacific Palisades, Calif. 90272

Filed Dec. 2, 1988, Ser. No. 279,207
Int. Cl.[4] A47F 5/00
U.S. Cl. 211—183 **10 Claims**



1. A covering system for a merchandise rack having a rack element comprising:

a cover element comprising an elongate tubular member having a first axial slot and a second axial slot extending along its length;

at least one corner element having a distal end in abutting relationship with said cover element and further comprising a generally L-shaped tubular member having an L-shaped slot extending along its length; and

spacer means extending within the interior of said cover element and said corner element, said first axial slot and said L-shaped slot frictionally engaging the rack element of the merchandise rack and said spacer means abutting said rack element when said cover element and said corner element are positioned upon said merchandise rack.

4,898,286

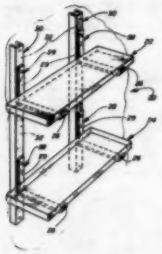
STORAGE SYSTEM AND CONNECTOR FOR THE SAME

Arthur A. Orlandi, 507 Shady La., North Barrington, Ill. 60010

Filed Feb. 19, 1988, Ser. No. 158,301

Int. Cl.[4] A47F 43/00

U.S. Cl. 211—187 **21 Claims**



1. In a system for storing various articles, a connector for supporting a shelf, or an upwardly extending article-supporting hook, in an elevated position, which connector comprises:

(a) an outwardly facing, generally vertical, support wall, said outwardly facing support wall defining a two-armed slot, said slot including first and second elongated arms extending away from each other from a common junction, said first elongated arm extending upward from said junction at a first predetermined acute angle to the horizontal, said second elongated slot arm extending downward from said junction at a second predetermined acute angle to the horizontal, the direction in which said second slot arm extends downward being a direction other than 180° to the direction in which said first elongated slot extends upward;

(b) a hanger having (i) a vertical arm connected to said outwardly facing support wall in the manner hereinafter described; and (ii) an outwardly extending member providing support for said articles to be stored, said hanger being positioned in front of and in contact with said support wall; and

(c) a downwardly extending hanger-supporting hook fixedly secured to said hanger, said hook having a generally horizontal shank and a free end portion, said hook free end portion extending downward from said shank in a direction that is substantially 180° to the direction in which said first elongated slot arm in said outwardly facing support wall extends upward, said hook free end portion being insertable in said first elongated slot arm, said hook shank extending from in front of said support wall, adjacent the end of said downwardly extending second slot arm that is remote from said slot junction, through said second elongated slot arm, said hook free end portion extending transverse to said second elongated slot arm to a position behind said support wall.

4,898,287

QUICK DISCONNECT BOOM MOUNT

John A. Blatt, 47 Willison, Grosse Pointe Shores, Mich. 48236

Filed Jul. 6, 1988, Ser. No. 215,743

Int. Cl.[4] B66C 23/70

U.S. Cl. 212—177 **4 Claims**

1. A quick disconnect boom mount comprising:

a first and a second block-like coupling member having respective end faces adapted to be seated in face-to-face engagement with each other when said coupling members are in a coupled position;

guide rods fixedly mounted in said first coupling member and projecting in spaced parallel relationship from said end face of said first coupling member;

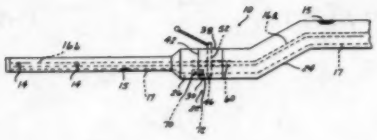
means defining guide rod receiving bores, corresponding in number to said guide rods, extending into said second coupling member from the end face of said second coupling member, along spaced parallel axes, said bores in said second coupling member being adapted to slidably receive said guide rods of said first coupling member, said guide rods and said receiving bores cooperating to guide said coupling members to and from said coupled position;

sealing means, disposed between said guide rods and said coupling members when said coupling members are in said coupled position;

means defining fluid passage bores extending longitudinally through said first and second coupling members and said guide rods in coaxial fluid communication with each other when said coupling members are in said coupled position;

electrical means extending longitudinally through said first and second coupling members;

connector means, disposed at said end faces of said coupling members, for connecting said electrical means in said first



and second coupling members when said coupling members are in said coupled position;

means defining a third bore in said second coupling member extending along a third axis normal to and offset from said parallel axes, said third bore intersecting one of said guide rod receiving bores;

a rotary locking member mounted within said third bore for rotation therein;

an eccentric cam portion on said locking member at the intersection of said third bore and said one of said guide rod receiving bores;

means defining a clearance recess in said locking member, diametrically opposed to said eccentric cam portion;

means defining a cam receiving recess in that guide rod receivable in said one of said guide rod receiving bores, said rotary member being rotatable within said third bore between a release position wherein said clearance recess is positioned to accommodate insertion or withdrawal of said guide rods into or from said guide rod receiving bores and a coupling position wherein said cam portion is engaged within said cam receiving recess to lock said coupling members in said coupled position.

4,898,288

SEMI-SUBMERSIBLE CRANE VESSEL

Robert J. Erdbrink, Leiden, Netherlands, assignor to Heerema Engineering Service BV, Leiden, Netherlands

Filed Mar. 5, 1985, Ser. No. 708,441

Claims priority, application United Kingdom, Mar. 5, 1984, 8405689

Int. Cl.[4] B63B 39/03

U.S. Cl. 212—191 **7 Claims**

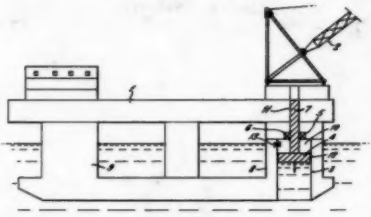
1. In a semi-submersible crane vessel having a heavy lift crane mounted on a working deck of the vessel, which working deck is supported by a plurality of columns which extend from a buoyant structure that is at least partly submerged, the combination of:

a chamber formed at least partly in two of said columns, each chamber having a longitudinal axis that extends vertically;

a vertically movable piston slidably arranged in each of said

chambers, with each chamber being open to sea water below its respective piston;

independently controlled power-operated means on the vessel directly connected to each piston to effect vertical movement of the pistons in opposite directions within their respective chambers to alter the buoyancy of the



vessel and thereby rapidly compensate for variations of load carried by the crane whereby said vessel is maintained substantially level during operation of the crane; and

valve means that admit air into said chambers above said pistons.

4,898,289

METHOD OF HANDLING A LOAD WITH A CRANE VESSEL HAVING MOVABLE LOAD SUPPORTS

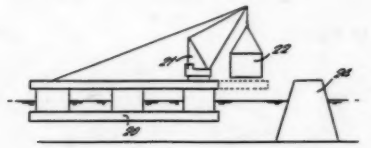
Wietse J. van de Wetering, The Hague, Netherlands, assignor to Heerema Engineering Service BV, Leiden, Netherlands

Filed Aug. 8, 1988, Ser. No. 229,315

Claims priority, application United Kingdom, Aug. 7, 1987, 8718768

Int. Cl.[4] B66C *23/52*; B63B *27/00*

U.S. Cl. 212—270 **1 Claim**



1. A method of using a crane vessel of the kind having at least one heavy lift crane operable in a working position to lift and lower loads clear of the vessel over a side or an end of the vessel, comprising the steps of picking up a load using the crane in its working position, positioning support means on the vessel in a load carrying position in which the support means is directly beneath the crane in its working position and is supported vertically at least partly by the vessel, lowering a load onto the support means, transporting the vessel to an installation site with the load on the support means, picking up the load from the support means at the installation site, removing the support means from its load carrying position, positioning the vessel adjacent the installation site and depositing the load at the installation site the load using the crane in its working position.

4,898,290

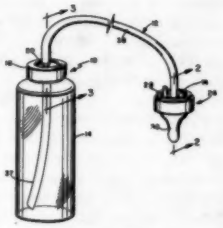
CONVERTIBLE BABY FEEDING BOTTLE

Prudente G. Cueto, 13617 Paseo Cardiel, San Diego, Calif. 92129

Filed Jul. 11, 1988, Ser. No. 216,510

Int. Cl.[4] A61J *9/00, 11/04*

U.S. Cl. 215—11.1 **15 Claims**



1. A baby feeding bottle assembly, comprising:

a bottle having an open end, a first, interengageable formation on the open end of the bottle;

a cap having an opening, a second formation on the cap comprising means for releasable mating engagement with said first formation for releasably securing the cap to the bottle;

tubular fluid conducting means extending from the interior of the bottle through the cap opening for conveying fluid out of the bottle, the fluid conducting means including an external flexible tube extending from the cap member outside the bottle; and

a nipple assembly for mounting at the free end of the external flexible tube, the assembly including an adapter member having connector means for securing the adapter member to the free end of the tube, a nipple, and a retainer ring for selectively securing the nipple to the adapter member or to the open end of the bottle, the retainer ring and adapter member having co-operable mating third and fourth formations, respectively, for releasable mating engagement to secure the nipple to the adapter member, the third formation being identical to the second formation on the cap and the fourth formation being identical to the first interengageable formation on the open end of the bottle to allow the retainer ring to be releasably secured to the adapter member or bottle, the adapter member having a through bore connecting the tube to the nipple.

4,898,291

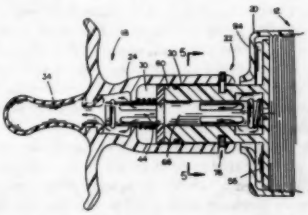
NURSING BOTTLE WITH REMOVABLE PACIFIER

John C. Sailors, 3511 Pine St., Omaha, Nebr. 68105

Filed Mar. 29, 1989, Ser. No. 331,515

Int. Cl.[4] A61J *9/00*

U.S. Cl. 215—11.4 **7 Claims**



1. A nursing bottle, comprising:

a bottle portion having a lower end and an open upper end;

a cap removably mounted on the upper end of said bottle portion to retain fluid therein;

said cap having a removable pacifier portion thereon;

said cap having a first valve means therein operable between an open position, wherein fluid within the bottle is allowed to flow therethrough, and a closed position, wherein fluid within the bottle is sealed therein;

said first valve means including biasing means for biasing said first valve into the closed position when said cap is removed from said pacifier portion;

said pacifier portion including a body having a bore therethrough to allow the flow of liquid;

a resilient nipple mounted on the upper end of said body, in communication with said bore, to receive fluid therein;

said nipple having a feeding opening therein;

said pacifier portion having a second valve means operably mounted within said bore and operable between an open position, wherein fluid is prevented from flow therethrough, and a closed position, wherein fluid is prevented from flowing therethrough;

said pacifier being selectively releasably connected to said cap;

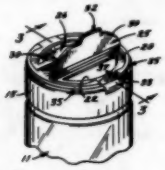
said first valve means being cooperable with said second valve means such that said valve means are in the open position when said pacifier portion and cap are connected, and such that said valve means are in the closed position when said pacifier portion and cap are disconnected.

4,898,292

CONTAINER CLOSURE WITH HINGED FLAP

Gordon E. VerWeyst, Rockford, Ill.; Charles E. Burk, Beloit, Wis., and Douglas E. Pherigo, Loves Park, Ill., assignors to J. L. Clark, Inc., Rockford, Ill.

Filed Jan. 17, 1989, Ser. No. 297,053
Int. Cl.[4] B65D *51/18*
U.S. Cl. 215—237 **11 Claims**



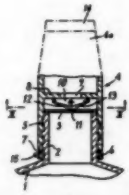
1. A one-piece container closure molded of resiliently yieldable plastic, said closure comprising a generally horizontal platform formed with a vertically extending dispensing opening, a closure flap, a hinge extending across said platform and supporting said flap to swing upwardly and downwardly between open and closed positions relative to said dispensing opening, said flap lying in face-to-face relation with said platform when in said closed position, said flap having a free edge extending around said flap from one end of said hinge to the other end thereof, a lift tab projecting outwardly from said free edge approximately midway along the length of said free edge to facilitate swinging of said flap to said open position, ribs upstanding from said platform and shielding the free edge of said flap when said flap is in said closed position, said ribs having adjacent ends which are spaced from one another to define a space between said ribs for said lift tab, said lift tab having side edges located adjacent the ends of said ribs, and means on the ends of said ribs and coacting with the side edges of said lift tab to hold said flap releasably in said closed position.

4,898,293

CLOSING DEVICE FOR CONTAINERS

Simone Morel, Montmirail, France, assignor to Societe de Conseils et D'Etudes Des Emballages S.C.E.E., Dammartin en Goele, France

Filed May 25, 1988, Ser. No. 202,572
Claims priority, application France, May 25, 1987, 8707347; Oct. 28, 1987, 8714953
Int. Cl.[4] B65D *41/50*
U.S. Cl. 215—250 **17 Claims**



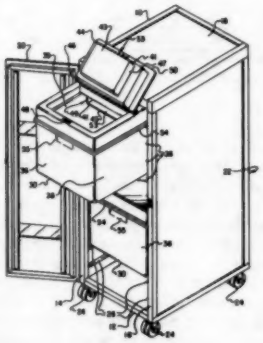
1. A closing device for a container in which a cap is put in position on a neck of the container, said neck defining a mouth sealed by a membrane, said cap comprising a side wall surrounding said neck and engagement means for engaging the neck of said container and opening and closing said container, a perforation member mounted in the vicinity of said membrane and carried by a partition of the cap, said partition having at least one hole therethrough, said perforation member being provided for folding back said membrane toward an inner surface of said neck side wall, and control means for controlling the position of said perforation member so that said perforation member occupies a first position in which it cannot act on the membrane and at least a second postion in which said membrane is broken and folded back by said perforation member in order to provide free communication between said container and inside of said cap.

4,898,294

FROZEN FOOD CONTAINER FOR AIRCRAFT USAGE

Gary K. Jennings, 2428 Forest Brook La., Apt. 1104, Arlington, Tex. 76011

Filed Aug. 31, 1988, Ser. No. 238,397
Int. Cl.[4] A47J *41/00*
U.S. Cl. 220—3.1 **2 Claims**



1. A frozen food container for use in conjunction with a wheeled cart of the type utilized in food service on a commercial aircraft and characterized by opposed side walls having

opposed shoulders which support food and beverage trays and open containers within the interior of the cart, comprising:

thermal insulating material positioned between an interior and exterior shell forming a bottom wall, opposed end walls, opposed side walls and a top wall;

the top wall including an insulated lid pivotally supported on the top wall and including means for normally retaining the insulated lid in a closed condition; and

opposed shoulders extending outwardly from the exterior of the side walls of the container and adapted to engage the shoulders of the wheeled cart to support the container therein, whereby the container is transported along the aisles of the aircraft and is adapted for withdrawal from the cart to facilitate opening of the insulated lid of the top wall to provide access to frozen food items within the container for service to aircraft passengers.

4,898,295

SPIN WELDED, TAMPER-PROOF, RESEALABLE THERMOPLASTIC CONTAINER

Dae Sik Kim, 49 Floral Street, Newton, Mass. 02161

Filed May 3, 1988, Ser. No. 189,638
Int. Cl.[4] B65D *6/00*
U.S. Cl. 220—66 **12 Claims**

1. A tamper-proof, resealable container comprising:

an open-top cylindrical container including a circular opening proximate a first end of said container;

holding means, including three radially symmetrical legs, disposed on a second, closed end of said container for preventing rotation of said container about its central axis;

a cap having a circular base for forming a spin welded joint with the circular opening of said container;

said cap also including a predetermined part opposite the base of said cap which provides an opening upon removal and becomes a tight fitting resealable closure for said opening when reversed, said predetermined part comprising a cylindrical base having an outside dimension substantially identical to the outside dimension of the cap around said opening, and a cylindrical plug having an outside dimension substantially identical to the inside dimension of said opening;

means, located proximate the bse of said cap, for holding said cap from rotating about its central axis, said means for holding said cap from rotating including means for storing said predetermined part when removed from the dispenser cap; and

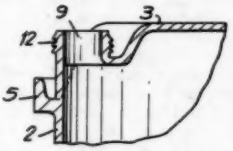
means for aiding removal of said predetermined part from said cap.

4,898,296

BUNGED VESSEL

Märten Burgdorf, Heimerzheim; Wilhelm Kühne, Wiesenbach, and Udo-Hermann Maus, Bammental, all of Fed. Rep. of Germany, assignors to Mauser-Werker GmbH, Bruhl, Fed. Rep. of Germany

Filed Apr. 7, 1988, Ser. No. 178,678
Int. Cl.[4] B65D *1/20*
U.S. Cl. 220—72 **4 Claims**



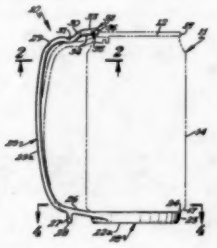
1. In a bunged vessel of thermoplastic material having a shell, head and bottom ends and transport rings formed in one piece with the shell and arranged in the region of the head and bottom ends, the shell having a generally cylindrically shaped portion extending between the ends of the vessel and one of the transport rings being disposed at the juncture of the shell and head end and extending around the shell and having a first portion extending radially outwardly of the cylindrically shaped portion of the shell and a second vertically extending portion at the radial outer end of the first portion, and bungs disposed below the uppermost surface of the head end and defining bung holes disposed in the head end, the improvement characterized in that at least one of the bungs is disposed laterally outwardly of the head end with the interior and exterior wall surfaces thereof flush with the interior and exterior wall surfaces of the cylindrical portion of the shell of the vessel at the laterally outward end of a common diameter of the bung hole and cylindrical portion of the vessel and in that said at least one bung is threaded, and any wall surface of the cylindrical shell part of the vessel or extension thereof bounding the bung is also threaded.

4,898,297

DETACHABLE HANDLE AND COASTER FOR A BEVERAGE CONTAINER

Charles L. Wheeler, 1912 - 13th St. 3outh, St. Cloud, Minn. 56301

Continuation-in-part of Ser. No. 168,460, Mar. 15, 1988, abandoned. This application Jan. 5, 1989, Ser. No. 293,803
Int. Cl.[4] B65D *25/28*
U.S. Cl. 220—85 H **1 Claim**



1. A single-piece coaster and handle device molded from a rigid plastic material for ready attachment to a cylindrical beverage can having an upper wall, an upper annular bead integral with the upper wall, and a lower wall, said coaster and handle device comprising:

a generally circular coaster structure including a flat central support wall of circular configuration having a central opening therein and being of a size for supporting the lower wall of a beverage can thereon, an annular depending wall integral with said flat central support wall and depending therefrom, an annular substantially flat bead-supporting wall integral with said depending annular wall and extending outwardly therefrom, said flat bead-supporting wall integral with said depending annular wall and extending outwardly therefrom, said flat bead-supporting wall having a flat upper surface and a flat lower surface, an annular outer wall integral with said bead-supporting wall and extending upwardly and outwardly therefrom and having an upper edge disposed in a horizontal plane located above the flat central support wall,

a generally C-shaped handle including a curved lower handle element integral with said coaster structure and extending outwardly and upwardly therefrom, a curved vertical handle element integral with said curved lower handle element and extending upwardly therefrom, a curved upper handle element integral with said vertical handle element and extending outwardly therefrom in substantially overlying relation with said curved lower handle element, said vertical handle element and said upper handle element being of uniform width, said upper handle element being shaped to define a thumb rest in the upper surface thereof to facilitate holding of said coaster and handle device by a user,

said upper handle element including a curved portion and a terminal portion, said terminal portion having a width dimension corresponding to the width dimension of the vertical handle element, said terminal portion having flat upper and lower surfaces and having a downwardly facing, transversely extending arcuate slot therein to define an outer lip and an arcuate gripping surface opposed to said outer lip, said outer lip comprising the outer end of said terminal portion, said arcuate gripping surface having a plurality of gripping elements integral therewith and projecting outwardly therefrom towards said outer lip for gripping the upper bead of a beverage can projecting into said slot, and

a flat rectangular-shaped support element integral with the curved lower handle element and extending transversely thereof, said support element being spaced outwardly of said coaster structure and having a width dimension corresponding to the width dimension of the vertical handle element and said upper handle element, said support element having a flat lower surface disposed in the same horizontal plane as the horizontal plane of the lower surface of said annular bead-supporting wall.

4,898,298

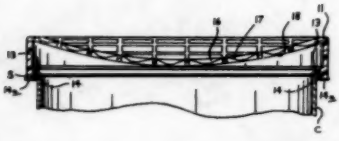
FLYING INSECT CONTAINER GUARD

Annie B. Norris, 1708 S. Scott, South Bend, Ind. 46613

Filed Mar. 29, 1989, Ser. No. 330,220

Int. Cl.[4] A47G *19/22*

U.S. Cl. 220—90.2 **1 Claim**



1. A flying insect container guard in combination with a container, said container formed of a cylindrical configuration including an outwardly extending edge seam at an upper terminal end of container, and wherein said guard comprises,

an annular skirt including engagement means for capturing said seam, and

a continuous mesh screen integrally secured to an upper continuous interior edge of said skirt, and

wherein said mesh screen is secured to an upper terminal edge of said skirt by an intermediate planar rim, and

wherein said mesh screen is of a concave downwardly depending configuration relative to said skirt, and extends downwardly relative to said skirt, and

wherein said engagement means includes a circular abutment flange means extending orthogonally interiorly of said skirt below said rim and above a lower terminal edge of said skirt to contact and abut an upper surface of said seam, and

wherein said engagement means further includes a circular seal secured within a circular groove underlying the flange and spaced below the flange a distance equal to the width of the seam to capture the seam between the flange and the seal, and

wherein said screen extends downwardly a distance equal to a length defined between the rim and an underlying surface of the flange to position the screen in an overlying contact to an upper surface of the container, and

wherein the screen includes a matrix of openings, and wherein each of the openings include a plurality of inwardly tapering walls to define an orifice aligned with and underlying the opening for metering of fluid through the orifices to the opening, and

further including a single downwardly depending leg aligned with the skirt in a first position and pivotal to a second position outwardly of the skirt to enable removal of the skirt from about the container, and

wherein the skirt and screen are formed of a flexible material.

4,898,299

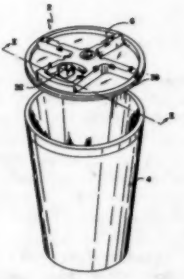
PUSH AND DRINK LID

David H. Herbst, Ocean City, Md., and Chris E. Boes, LaRue, Ohio, assignors to Imperial Cup Corporation, Kenton, Ohio

Filed Mar. 3, 1988, Ser. No. 163,623

Int. Cl.[4] B65D *47/10*

U.S. Cl. 220—90.4 **20 Claims**



1. A detachable, drink-through lid for open-mouthed containers having a peripheral rim defining the open-mouth thereof comprising:

peripheral curl means defining a rim receiving cavity extending around a periphery of said lid, said cavity detachably receiving said rim of said container in order to retain said container lid on said container;

central web means extending across said container lid;

drink-through means comprising a well portion defined by said central web means and a raised element positioned within said well portion, said raised element having a plurality of corners and a top surface, said raised element

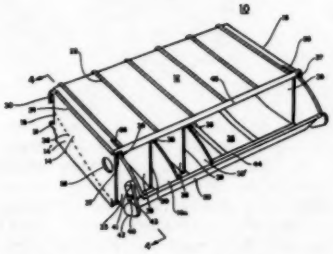
including relatively frangible areas adjacent said corners, said well portion of said lid initially being sealed when said container lid is received on said container, whereafter a pressure exerted on said top surface of said raised element causes slits to be formed adjacent said corners in said relatively frangible areas while avoiding deformation of said peripheral curl means, said slits permitting contents within said container to be dispensed therethrough and ingested from said well portion, said well portion having a bottom which is positioned above a bottom of said central web means before said slits are formed.

4,898,300

MOLDED CLOSEABLE BIN HAVING A SHAPED HOPPER

Joel B. Cohen, Gwynedd, and Matthew Marhefka, Southampton, both of Pa., assignors to Shell Containers, Inc., Ambler, Pa.

Filed Jun. 6, 1988, Ser. No. 203,479
Int. Cl.[4] B65D *43/00, 45/00, 51/00*
U.S. Cl. 220—334 18 Claims



1. An improved bin having a bin compartment for storing objects, said pin providing access to said objects for removal from said bin compartment, comprising:

a bottom wall having a front edge;

first and second exterior side walls integrally formed with said bottom wall;

a top wall having a front edge, said top wall integrally formed with said first and second exterior side walls;

a back wall integrally formed with said first and second exterior side walls and said bottom wall; and

a hopper having a pair of hopper side walls and a protruding front with a lower edge and an upper edge, said lower edge of said hopper hangable attached to said front edge of said bottom wall, said hopper being movable between a closed position where said upper edge of said hopper mates with said front edge of said top wall to close said bin and said pair of hopper side walls are received by said protruding front defining a front wall for said bin in said closed position and providing an open position where objects may be removed from outside said bin;

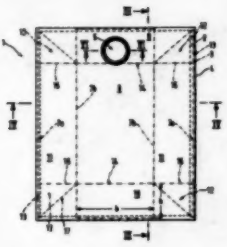
said protruding front of said hopper having first and second portions integrally joined at an angle, said first portion approximately aligned with said bottom wall when said hopper is in said open position, said second portion defining a front wall for said bin when said hopper is in said open position, said pair of hopper side walls defining an extension of said exterior side walls for said bin when said hopper is in said open position, wherein said upper edge of said hopper is formed along an edge of said second portion and said upper edge is spaced away from said front edge of said top wall when said hopper is in said open position.

4,898,301

COLLAPSIBLE CONTAINER FOR FLOWABLE MEDIA

Henning Schick, Poststrasse 11, D-7843 Heitersheim, Fed. Rep. of Germany

Filed Feb. 23, 1989, Ser. No. 315,459
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1988, 8802437[U]; Apr. 12, 1988, 8804786[U]; Apr. 12, 1988, 8804787[U]; Apr. 26, 1988, 8805513[U]; European Pat. Off., Aug. 13, 1988, 88113182.5
Int. Cl.[4] B65D *5/00, 30/00*
U.S. Cl. 220—408 33 Claims



1. A container, particularly for flowable media, comprising an inner envelope including a deformable bag having a first opening for admission or evacuation of flowable media; an erectable and collapsible frame surrounding said bag and including, in the collapsed condition thereof, two overlapping sections and two parallel first fold lines hingedly connecting said sections to each other, each of said sections having a plurality of panels and second fold lines parallel to said first fold lines and hingedly connecting the panels to each other, at least one of said sections further comprising two flaps for at least one of said panels of said at least one section and two third fold lines normal to said first fold lines and hingedly connecting said flaps to said at least one panel, said sections being pivotable relative to each other along said first fold lines, the panels of each of said sections being pivotable relative to each other along the respective second fold lines and said flaps being pivotable relative to said at least one panel along the corresponding third fold lines for erection of said frame preparatory to admission of a flowable medium into said bag; and an outer envelope including a deformable sack surrounding said frame and having a second opening in register with said first opening; at least in erected condition of said frame.

4,898,302

APPARATUS FOR MELTING AND DISPENSING THERMOPLASTIC MATERIAL

David J. Byerly; Paul S. Frates, both of Lawrenceville, and Charles H. Scholl, Duluth, all of Ga., assignors to Nordson Corporation, Westlake, Ohio

Continuation of Ser. No. 2,173, Jan. 12, 1987, abandoned. This application Jan. 23, 1989, Ser. No. 299,676
Int. Cl.[4] B67D *5/62*
U.S. Cl. 222—49 15 Claims

1. Apparatus for dispensing hot melt adhesive from a container having a neck formed with a discharge outlet, comprising:

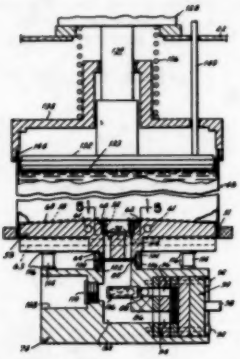
means for supporting the container;

a platen mounted in a position to contact the container, said platen having means for heating said platen to melt the hot melt adhesive within the container:

means for ejecting molten hot melt adhesive through the discharge outlet of the container;

heat transfer means carried by said platen and communicating with the discharge outlet of the container for transferring heat from said platen to the hot melt adhesive discharged through the outlet of the container, said heat

transfer means comprising a section of thermally conductive material formed with spaced passageways each having an elongated wall, said elongated walls each contacting a portion of the melted hot melt adhesive ejected from



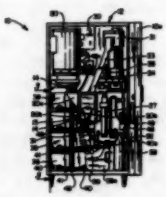
the container for transferring heat from said platen uniformly throughout the melted hot melt adhesive; pump means communicating with said spaced passageways for pumping the melted hot melt adhesive to a dispenser.

4,898,303

CUP-TYPE DRINK MERCHANDISER WITH BAG-IN-BOX PRODUCT SUPPLY SYSTEM

Danny E. Large, Newark, and Mark S. Tschanen, Columbus, both of Ohio, assignors to Liqui-Box Corporation, Worthington, Ohio

Filed Oct. 27, 1988, Ser. No. 263,583
Int. Cl.[4] B67D 1/16
U.S. Cl. 222—65 **7 Claims**



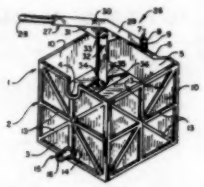
1. A liquid dispensing machine for dispensing successively a plurality of liquids having a cup support for receiving and supporting successively liquid-receiving cups and having dispensing nozzles over the cup support for receiving the plurality of liquids, means for feeding cups successively onto said support, means for supplying a selected liquid to a selected nozzle, said supply means being in the form of a closed airtight supply system comprising first and second bag-in-box packages for each of said liquids connected to a service line of a supply pump, and a switch over cut-off valve in the service line between the bags of the first and second packages which will automatically switch when the one bag is emptied and said pump draws a vacuum of eighteen inches of mercury on the empty bag to thereby permit removal and replacement of that empty bag while the pump still draws liquid from the other bag, said box of each bag-in-box package including a generally flat lower surface, said flat surface being inclined downwardly toward said service line connection at an angle of about 8° to provide a gravity assist in emptying said package, said machine having one or more drainage tubes for draining waste liquid from the machine, and means for collecting that waste liquid, said collecting means comprising a disposable flexible bag connected by a coupling to said tubes, said bag being disposed in a relatively rigid container, and a switch for stopping the machine when the bag is full which is operated by contact with the bag, said bag being disconnectable from said tubes and removable from said container for disposal as a closed bag.

4,898,304

VISCOUS LIQUID DISPENSER

Benjamin E. Bacon, Jr., 487 Ockley Dr., Shreveport, La. 71105

Filed Dec. 17, 1987, Ser. No. 134,858
Int. Cl.[4] B67B 7/24
U.S. Cl. 222—82 **17 Claims**



1. A dispenser for dispensing a viscous liquid comprising a container having an open top for receiving a quantity of the viscous liquid; a plunger plate shaped to substantially conform to the interior cross-section of said container and extending into said container in slidable relationship said plunger plate adapted to selectively exert pressure on said viscous liquid; a lever having one end pivotally attached to said container; an elongated connector bar having a plurality of angular slots provided therein in spaced relationship, with one end of said connector bar pivotally attached to said plunger plate and the opposite end of said connector bar slidably projecting through said lever; a slot pin extending through said lever, whereby said slot pin may be selectively and progressively inserted into selected ones of said angular slots responsive to lowering of the level of the viscous liquid in said container; and a discharge opening provided in said container near the bottom thereof, said discharge opening communicating with the interior of said container for discharging the viscous liquid from said container responsive to operation of said lever.

4,898,305

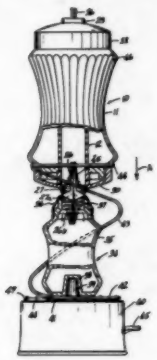
CONDIMENT CONTAINER AND DISPENSER

William Morris, 383 Ellsworth Ave., New Haven, Conn. 06511, assignor to William Morris, New Haven, Conn.

Filed Jul. 21, 1988, Ser. No. 222,023
Int. Cl.[4] A47G 19/12
U.S. Cl. 222—142.5 **18 Claims**

1. A condiment container and dispenser comprising a container having means therein defining a central chamber with an opening at one end of said container and a second chamber about said defining means with an opening at the other end of said container a closure member closing each of said open ends, said closure members having openings therethrough, a spring member of conical shape defined by closely spaced helices of decreasing diameter normally closing each of said openings, a plunger member carried by each of said springs and

extending from said closure members, said plunger members being effective to extend an associated spring and permit mate-



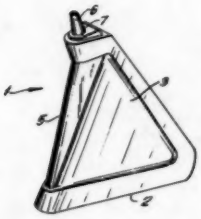
rial to be dispensed from either end of the container and dispenser by shaking or pouring.

4,898,306

COLLAPSIBLE CONTAINER FOR FLOWABLE SUBSTANCES

Greg Pardes, New York, N.Y., assignor to Reseal International Limited Partnership

Filed Jan. 13, 1988, Ser. No. 143,823
Int. Cl.[4] B65D *37/00*
U.S. Cl. 222—206 **7 Claims**



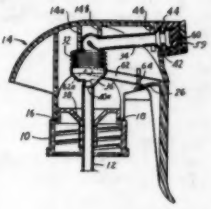
1. A container for dispensing flowable substances and being displaceable between an expanded condition and a collapsed condition comprising wall means forming an enclosed space for holding the flowable substance, said wall means including a pair of generally rigid walls having bordering edges, collapsible walls interconnecting a part of said bordering edges of said rigid walls, and a web connecting the remainder of said bordering edges of said rigid walls, in the expanded condition of said container said rigid walls being in gradually diverging relationship extending from said web in the expanded condition of said container and said web affording pivotable movement of said rigid walls for placing said container in the collapsed condition, said collapsible walls being displaceable between the expanded condition and the collapsed condition, and in the collapsed condition said rigid walls are disposed adjacent to one another around said bordering edges and said container being in a flattened shape, and a part of said collapsible walls forming a base for said container with said rigid walls and said web extending upwardly from the base.

4,898,307

SPRAY CAPS

Paolo M. B. Tiramani, New York, N.Y., assignor to Goody Products, Inc., Kearny, N.J.

Filed Aug. 25, 1988, Ser. No. 236,592
Int. Cl.[4] B65D *37/00*
U.S. Cl. 222—207 **20 Claims**



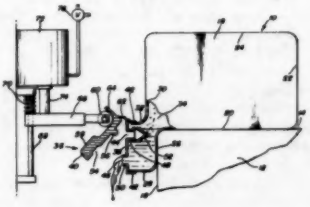
1. A manually operable spray cap including a main body having a closure for mounting the spray cap on a supply container of liquid to be dispensed, a nozzle having a discharge orifice, means forming a liquid passage from the supply container to the nozzle, including a bellows, a dip tube extending through the closure, and a discharge tube extending to the nozzle, said bellows having a movable end portion carrying the dip tube and a stationary end portion from which the discharge tube extends, said movable end portion and said stationary end portion constituting passage-constricting transitions between the bellows and the respective tubes, said bellows including said transitions and said discharge-passage tube and at least a portion of the dip tube extending from said movable end portion constituting a continuous-wall one-piece component formed of resilient plastic, said bellows having a corrugated lengthwise-compressible self-extending side wall, intake and discharge check valves for limiting the liquid to flow toward the nozzle, and a trigger carried by said main body for operating said movable end portion of the bellows and the dip tube therewith in bellows-compressing strokes.

4,898,308

REMOVABLE SYRUP PACKAGE

Arthur G. Radick, Marietta, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

Filed Aug. 17, 1988, Ser. No. 233,133
Int. Cl.[4] B65D *88/34*
U.S. Cl. 222—325 **20 Claims**



1. Apparatus for a beverage dispensing system comprising:

a removable package containing liquid to be dispensed and including a body portion and a liquid discharge portion having a discharge port therein from which said liquid may be dispensed;

an actuated closure assembly including a stationary facing member disposed over said discharge port and having an air inlet opening and a liquid outlet opening therein, and a cap member pivotally attached to said facing member and

having means for closing off said air inlet opening and said liquid outlet opening when in contact therewith during a closed operating state and exposing said openings when said cap member is pivoted away from said facing member during an open operating state; and

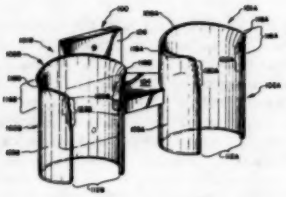
actuator means for pivoting said cap member between said closed and open operating state, said actuator means comprising a movably driven member in contact with said cap member and being movable between a first and a second position to effect said closed and open operating state.

4,898,309

APPARATUS USED TO FACILITATE THE DONNING OF ELASTIC GLOVES

Dan E. Fischer, Sandy, Utah, assignor to Ultradent Products, Inc., Salt Lake City, Utah

Filed Jan. 28, 1988, Ser. No. 149,352
Int. Cl.[4] A47G *25/90*
U.S. Cl. 223—111 **41 Claims**



1. An apparatus for installing a glove having an elastic cuff onto a hand, the apparatus comprising:

a fixed bracket holding means, mountable to said fixed bracket so as to become integrally attached to said bracket as a part thereof when so mounted, for receiving the elastic cuff of the glove and for holding the cuff in a stretched, stationary, open configuration when the elastic cuff of said glove is stretched over said holding means, such that the glove is thereby held stretched and open and is ready to receive the hand inserted therein; and

release means, formed on the holding means, for releasing the glove onto the hand after the hand is inserted therein and as the hand is moved downwardly and pulled forward so as to thereby pull the elastic cuff of said glove off of said holding means.

4,898,310

CENTER OF GRAVITY HOLSTER

Robert W. Remington, Kamiah, Id., assignor to Claude R. Wimer, Jr., Naples, Fla., a part interest

Filed Oct. 4, 1985, Ser. No. 784,492
Int. Cl.[4] F41C *33/02*
U.S. Cl. 224—238 **11 Claims**

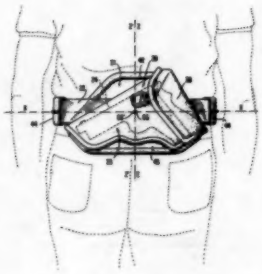
1. A pistol holster assembly comprising:

a united holster body and back pad, a waist-encircling belt carrying the united holster body and back pad and having releasable fastener means,

the united holster body and back pad during use being worn on the back of a wearer of the assembly with the center of balance of a pistol contained in the holster body located substantially on a horizontal axis substantially coinciding with the horizontal axis through the center of gravity of the body of a wearer of the assembly,

said back pad being arranged forwardly of the holster body relative to the back of a wearer and directly engaging and lying within the small of the back and being sufficiently large in area to span to a substantial degree the area of the small of the back and having a contoured marginal edge which approximately matches the natural contours of the small of the back thereby causing the back pad to be centered and stabilized while in contact with the small of the back,

the holster body being disposed with a pistol barrel receiving portion thereof at an acute negative angle to the horizontal, and



the holster body being of a size spanning a major portion of the area of the back pad both horizontally and vertically, the combined thicknesses of the united holster body and back pad being such that the assembly can lie substantially within a natural cavity defined by the small of the back.

4,898,311

BINOCULAR STABILIZER DEVICE

Robert Boyer, 216 Honeysuckle Ave., Paso Robles, Calif. 93446

Filed Apr. 18, 1988, Ser. No. 182,908
Int. Cl.[4] A45F *3/14*; A44B *11/20, 21/00*
U.S. Cl. 224—257 **4 Claims**

1. In connection with an article supported by the neck of its user and suspended about the user's body, a device for keeping the article secured to the user's body, comprising:

a length of elastic tubing;

means for interconnecting the elastic tubing at each end to the article including an elongated gripping piece having at least two ridges perpendicular to a longitudinal dimension of the gripping piece for gripping the elastic tubing when the gripping piece is installed within the elastic tubing; and means for securing each gripping piece to the article whereby;

the elastic tubing is adopted to be installed around the user and interconnected to the article.

4,898,312

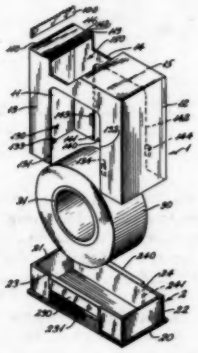
CASSETTE TAPE HOLDING BOX AND DISPENSER

Harrison Hwang, No. 23, Lin Tsuo Road, Shankang, Taichung Hsien, Taiwan

Filed Jul. 22, 1988, Ser. No. 222,927
Int. Cl.[4] B26F *3/02*; B65D *85/676*
U.S. Cl. 225—26 **4 Claims**

1. A portable holder and dispenser for adhesive or pressure

sensitive tape comprising a receptacle having an open bottom portion for containing a roll of tape, the receptacle being formed of a pair of aligned parallel front and rear walls, a pair of aligned parallel side walls and first and second spaced apart top panels separated by an opening and running transversely between corresponding segments of the upper edges of the side walls, a hole extending from the lower edge of each of the side walls to the central part thereof respectively, securing means being provided on each of the inner side edges of the hole to engage a tape holding base, the first top panel having on the



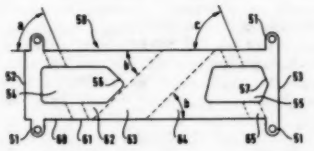
upper, front edge thereof a furrow and on the upper edge adjacent the opening serrations for engaging the adhesive or pressure sensitive surface of the tape, cutting means adapted for insertion into the furrow, the tape holding base being adapted for insertion into the open bottom portion of the receptacle and comprising a pair of side plates and a base plate linking the side plates, each of the side plates having an opening on the inner edge thereof for holding the tape roll, and means for engaging the securing means in the receptacle to retain the tape holding base within the open bottom portion of the receptacle.

4,898,313

TRANSPORT DEVICE FOR TRANSPORTING OBJECTS IN THE FORM OF STRIP SEGMENTS

Jean-Pierre Grégoire, Bagneux, France, assignor to SMH Alcatel, Paris, France

Filed May 24, 1988, Ser. No. 197,876
Claims priority, application France, May 25, 1987, 87 07318
Int. Cl.[4] B65H *23/32*
U.S. Cl. 226—197 **4 Claims**



1. A transport device for transporting objects in the form of strip segments along their axis while causing said strips to rotate through an angle of at least 90° about the axis, said device comprising two walls disposed parallel to each other, means for holding said walls spaced apart from each other in such a manner as to allow the objects to be transported to pass therebetween, said walls being twisted together about their longitudinal axes so that the slot between them at one of the ends of said walls is oriented in a direction rotated at least 90° relative to the direction of the slot at the other end of said walls, said walls being in the form of a twisted flat strip whose width is not less than the width of the objects to be transported, and wherein each of said walls comprises between one wall and in the other wall end, successive juxtaposed portions having the following shapes respectively:

a first rectangular trapezium;
a first end parallelogram;
a first common trapezium;
a middle parallelogram;
a second common trapezium;
a second end parallelogram; and
a second rectangular trapezium;

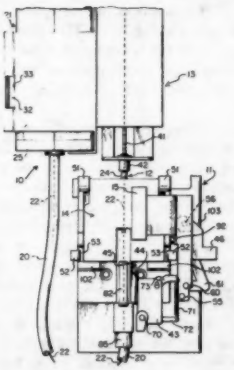
with the desired twist being obtained with the trapeziums being flat, with the end parallelograms being curved as portions of cylindrical surfaces and in the same direction about the original plane surface, and with the middle parallelogram being curved in the opposite direction to also form a portion of a cylindrical surface.

4,898,314

METHOD AND APPARATUS FOR STITCHER WIRE LOADING

Richard D. Stroh, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 20, 1988, Ser. No. 260,159
Int. Cl.[4] B42B *4/00*
U.S. Cl. 227—3 **23 Claims**



1. A wire dispensing supply item having a reel of wire that includes a wire end, said supply item being for use with a stitcher having wire cutting means, wire feeding means for feeding said wire end to said wire cutting means, and manually operable coupling means for releasably receiving a handle/mounting member of said supply item, said handle/mounting member, when coupled to said coupling means, being operable to support said wire end in operative relation to said wire feeding means, said supply item comprising;

a reel of wire rotatably mounted in a substantially closed housing,
a flexible tube having one end connected to said housing, said tube operating to guide said wire end away from said reel of wire,
a handle/mounting member connected to said tube at the other end thereof, said handle/mounting member being constructed and arranged to releasably cooperate with the manually operable coupling means of said stitcher, and
releasably wire holding means contained within said handle/mounting member for releasably holding said wire end,

the manually operable coupling means of said stitcher being

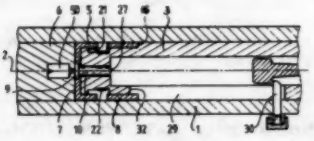
operable to couple said handle/mounting member with said wire end in operating relation to said wire feeding means, and in so doing, to release said releasable wire holding means.

4,898,315

EJECTOR SEALING APPARATUS

Jean-Claude Vernerey, Bourg-Les-Valence, France, assignor to Societe de Prospection et D'Inventions Techniques (S.P.I.T.), Bourg-Les-Valence, France

Filed Apr. 7, 1988, Ser. No. 178,709
Int. Cl.[4] B25C 1/14
U.S. Cl. 227—10 8 Claims



1. Apparatus for driving a fixing element or fastener into a receiving material, comprising:

a barrel holder (1);

a barrel (3) slideably disposed within said barrel holder (1) between a firing position and an open-ejection position;

means defining a housing bore (27) within said barrel (3);

inertia block means (4) movably disposed within said barrel (3) between a firing position and a fired position for driving said fixing element or fastener into said receiving material;

pawl means (30) projecting radially inwardly through a sidewall portion of said barrel holder (1) and said barrel (3) for engaging said inertia block means (4) when said inertia block means (4) is moved to said fired position so as to retain said inertia block means (4) within said barrel (3);

axially extending slit means (29) defined within said sidewall portion of said barrel (3) for housing said pawl means (30) so as to permit said barrel (3) to move axially relative to said barrel holder (1) and said pawl means (30) from said firing position to said open-ejection position;

a propulsive charge case (10), having a flanged rim portion (9), disposed within said housing bore (27) of said barrel (3) for generating propulsive gases for propelling said inertia block means (4) toward said fired position from said firing position;

breech means (6), and striker means (50) disposed within said breech means (6), for transmitting an impact force to said propulsive charge case (10) so as to cause said propulsive charge case (10) to generate said propulsive gases;

ejection ring means (5), comprising an end wall (7) within which said rim portion (9) of said propulsive charge case (10) is housed and a sleeve portion (8) mounted upon said barrel (3), movably mounted upon said barrel (3) between a first firing position and a second ejection position for ejecting said propulsive charge case (10) from said barrel (3) when said ejection ring means (5) and said barrel (3) are moved to said open-ejection position;

clip means (22,22') interconnecting said ejection ring means (5) and said barrel (3) together and movable with said ejection ring means (5) relative to said barrel (3) between said first firing position and said second ejection position; and

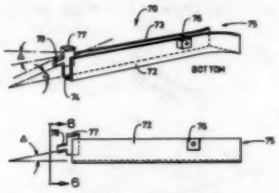
means (19,19') for increasing the resistance of said movement of said clip means (22,22') relative to said barrel (3) between said first firing position and said second ejection position.

4,898,316

FASTENER MAGAZINE AND GUIDE DEVICE

John E. McLaughlin, and Thomas A. McCardle, both of Cincinnati, Ohio, assignors to Senco Products, Inc., Cincinnati, Ohio

Filed Mar. 15, 1989, Ser. No. 323,859
Int. Cl.[4] B25C 7/00
U.S. Cl. 227—120 17 Claims



1. A fastener magazine and guide device for use with a moveable fastening tool attached to a magazine, comprising:

(a) a fastener magazine for containing a plurality of ordered fasteners in a coil and dispensing said fasteners tangentially from said coil for sequential insertion by said fastening tool;

(b) means for maintaining said fastener magazine substantially stationary and in substantially close proximity to said fastening tool; and

(c) guide means adapted to maintain said plurality of ordered fasteners substantially within a path from said fastener magazine to said fastener tool, said guide means coupled at its forward end to said fastener tool by an angled tongue adapted to fit within said fastener tool such that said guide means is mounted so as to move in concert with the movement of said fastener tool and sufficiently detached from said fastener magazine so as to prevent the transmission of substantial movement to said fastener magazine.

4,898,317

WELDING WIRE STRAIGHTENING DEVICE AND WELDING TORCH

Shigeo Ito, Nagoya; Toshihiko Imaeda, Niwa; Ryuhei Takagi, Owariasahi, and Ryutaro Sato, Obu, all of Japan, assignors to Daido Tokushuko Kabushiki Kaisha, Nagoya, Japan

Continuation of Ser. No. 309,983, Feb. 9, 1989, abandoned, which is a continuation of Ser. No. 940,950, Dec. 12, 1986, abandoned. This application Jun. 26, 1989, Ser. No. 373,608
Claims priority, application Japan, Jul. 14, 1986, 61-107860[U]
Int. Cl.[4] B23K 9/28, 9/12
U.S. Cl. 228—41 5 Claims

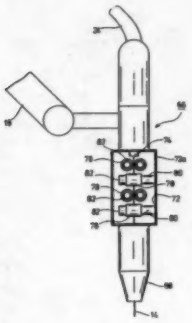
1. A device for straightening a welding wire comprising:

a frame having an inlet sleeve and an outlet sleeve on longitudinally opposite ends thereof, said inlet and outlet sleeves being coaxial to each other and said wire being fed through said inlet and outlet sleeves;

support pins provided at predetermined points in said frame, said support pins being freely movable in connection with said direction perpendicular to a wire feed path; and

three to five pairs of wire straightening rollers rotatably provided on said support pins and longitudinally spaced in

the direction of said wire feed path, roller surfaces of each pair of said rollers being transversely spaced from each



other and each of said pairs of rollers being provided at a phase angle of 60° to 90 ° from other pairs of rollers.

4,898,318

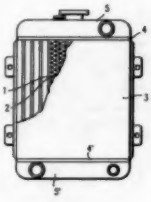
COPPER RADIATOR FOR MOTOR CARS EXCELLENT IN CORROSION RESISTANCE AND METHOD OF MANUFACTURING THE SAME

Syoji Shiga; Akira Matsuda; Nobuyuki Shibata, and Kiichi Akasaka, all of Nikko, Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo and Nippondenso Co., Ltd., Kariya, both of, Japan

Division of Ser. No. 903,948, Sep. 5, 1986, Pat. No. 4,775,004. This application Apr. 4, 1988, Ser. No. 177,066

Int. Cl.[4] B23K *1/14*

U.S. Cl. 228—183 **7 Claims**



1. In a method of manufacturing a copper radiator for automobiles characterized by assembling said radiator by fitting fins to the outside of a plurality of tubes, through which the heat-exchanging medium flows, by bonding with solder to form a copper core and fitting seat plate(s) to one end or both ends of said core by bonding with solder to connect tank(s), the improvement which comprises carrying out the soldering for forming the core in a nonoxidative atmosphere and/or heating the core in a reductive atmosphere during assembling of the radiator after soldering so that the thickness of oxidized film on the surface of the fins is not more than 1200 Å.

4,898,319

AMBIENT AIR EXCLUSION SYSTEM FOR BRAZING OVENS

Robert T. Williams, Newfane, N.Y., assignor to Bruce T. Williams, Lockport, N.Y.

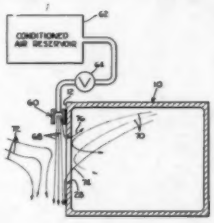
Filed Dec. 4, 1987, Ser. No. 128,933

Int. Cl.[4] F27D *7/00*; B23K *1/04, 35/38*

U.S. Cl. 228—219 **10 Claims**

1. In a brazing oven including a housing defining an interior region in which materials to be brazed are placed, an opening in said housing to allow introduction and removal of the materials, a door operatively associated with said opening for closing said opening during brazing and for opening during introduction and removal of the materials, means for heating the materials in said region, and means for providing a vacuum in said region during brazing, the improvement comprising:

means operatively associated with said opening for providing a flow of gas along one direction in said opening when said door is opened to provide a single barrier to prevent gas from exiting the oven interior and to prevent unconditioned ambient air from entering the oven interior when said door is opened, said barrier being provided exclusively by said flow of gas, said means for providing a flow of gas comprising:



(a) ported manifold means mounted in said housing interior adjacent the inside of said opening for providing a flow of gas across said opening; and

(b) reservoir means in fluid communication with said manifold means to supply gas to said manifold means;

(c) so that said manifold means also serves to introduce conditioned gas to said region after brazing.

4,898,320

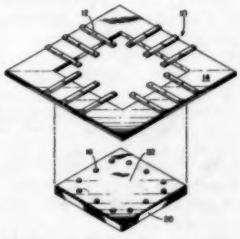
METHOD OF MANUFACTURING A HIGH-YIELD SOLDER BUMPED SEMICONDUCTOR WAFER

Thomas J. Dunaway, St. Louis Park; Richard K. Spielberger, Maple Grove, and Lori A. Dicks, New Hope, all of Minn., assignors to Honeywell, Inc., Minneapolis, Minn.

Filed Nov. 21, 1988, Ser. No. 274,207

Int. Cl.[4] B23K *31/02, 37/06*

U.S. Cl. 228—245 **17 Claims**



1. A method of manufacturing a high-yield fine pitch geometry solder bumped semiconductor wafer comprising the steps of:

(a) providing a nonsolderable transfer substrate having a transfer surface for receipt of solder material;

(b) depositing solder material onto the transfer surface to form solder bumps in a predetermined fine pitch geometry pattern;

(c) aligning solderable conductive elements of a semicon-

ductor wafer with the patterned solder bumps on the transfer surface; and

(d) reflowing the patterned solder bumps into wetted contact with the wafer conductive elements.

4,898,321

CASE AND PALLET SYSTEMS

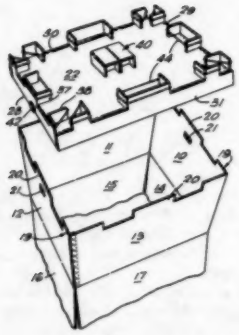
Paul N. Delany, 120 Maldon Road, Danbury, Essex, England

Filed Apr. 27, 1988, Ser. No. 185,117

Claims priority, application United Kingdom, Apr. 22, 1987, 8709464

Int. Cl.[4] B65D 90/12, 19/04

U.S. Cl. 229—23 R **9 Claims**



1. A pallet base for a case, the pallet base comprising a flat rectangular central portion and a peripheral flange portion at at least two opposed edges of the central portion, each flange portion being foldable from a flat state to an erect state in which the flange portion defines both an upstanding portion above the level of the central portion and a depending skirt portion below the level of the central portion, the skirt portion of each flange portion having flaps which can be folded inwards to overlie the underside of the central portion thereby to maintain the flange portions in an erect position, and retaining means comprising elastic bands to hold each of said flaps turned inwards through at least 90°.

4,898,322

AUTOMATED MACHINE ENVELOPE

James B. Coffey, Dayton, Ohio, and Leslie B. Gwynn, Winston-Salem, N.C., assignors to NCR Corporation, Dayton, Ohio

Filed Oct. 18, 1988, Ser. No. 259,371

Int. Cl.[4] B65D 27/00

U.S. Cl. 229—69 **20 Claims**

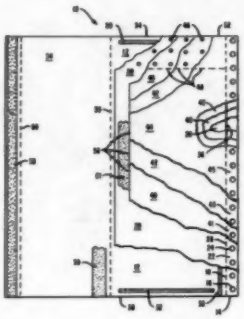
1. A multiple ply business form comprising a

back ply of one width having a control margin along one side thereof, an

intermediate ply of lesser width than said back ply and secured to said back ply by first securing means along at least two edges of the back ply and of the intermediate ply to form a pocket,

at least one additional ply secured by second securing means to said intermediate ply along one edge thereof to secure a first portion of the additional ply to the intermediate ply and including a line of weakening spaced from said one edge of said intermediate ply and adjacent said second securing means permitting removal of a second portion of the additional ply and leaving said first portion secured to the intermediate ply, the pocket formed by said back ply and said intermediate ply being of a size to accommodate the second portion of said additional ply in a flat, unfolded condition, and a

closure ply having a line of weakening connecting said closure ply and said back ply and foldable along said connecting line of weakening over the intermediate ply



for sealing the removed second portion of the additional ply which has been inserted in the pocket for record purposes.

4,898,323

MAILER FOR LASER PRINTER

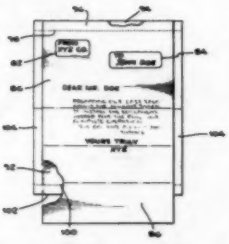
Tien-Tsung Chen, Claremont; C. Stefan Wegdell, Tustin, both of Calif.; Wayne L. Rutkowski, South Wales, N.Y., and Kim Y. Kao, Alhambra, Calif., assignors to Avery International Corporation, Pasadena, Calif.

Continuation-in-part of Ser. No. 64,074, Jun. 17, 1987, Pat. No. 4,784,317. This application Nov. 14, 1988, Ser. No. 270,785

The portion of the term of this patent subsequent to Nov. 15, 2005, has been disclaimed.

Int. Cl.[4] B65D 27/04, 27/14

U.S. Cl. 229—92.3 **19 Claims**



1. A unitary mailer for use with laser type printers or copier machines, involving heating of the paper, comprising:

sheet paper means for receiving a printed message and for forming an envelope; said sheet paper means having an upper half and a lower half, and having substantially rectangular dimensions, both of which are greater than six inches, said sheet paper means being substantially uniform in thickness and continuous for its upper half;

said sheet paper means including two overlying sheets of paper permanently adhered together along one edge of each of the two sheets, with one of said sheets being a message sheet and the other of said sheets being an envelope sheet;

printed message and address information printed on one side only of said sheet paper means, with the message starting on the exposed upper half of said message sheet;

said sheet paper means including means for forming an envelope from said envelope sheet;

means for sealing said envelope including a stable adhesive which will not flow or become activated from the heat of a laser printer or a xerographic copier machine or from high humidity storage conditions;

the upper half of said message sheet having predetermined areas in which the names and addresses of the sender and the addressee are to be printed; and

the lower half of said envelope sheet including window means for exposing the names and addresses of the sender and the addressee of the mailer when said envelope sheet is folded;

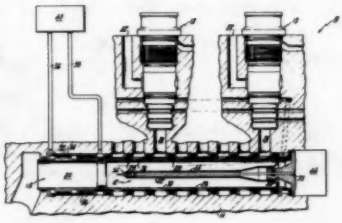
whereby said sheet paper means may be fed through a laser printer or a copier machine without jamming or contamination, with a single pass providing both the message and addressing.

4,898,324

METERING VALVE TEMPERATURE COMPENSATION

Robert H. Perkinson, Somers, Conn.; Charles F. Stearns, East Longmeadow, and Rene F. Belanger, Holyoke, both of Mass., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 30, 1989, Ser. No. 358,506
Int. Cl.[4] G05D *27/00*
U.S. Cl. 236—92 R **8 Claims**



1. Apparatus for metering a constant weight flow of fluid by compensating for temperature changes of said fluid, said apparatus comprising:

a temperature means for sensing a change in temperature, said temperature means changing a given percentage as said temperature of said fluid changes;

a valve means for metering said flow of fluid, said valve means having;

a window means having a cross sectional opening for controlling a flow of said fluid therethrough, and a spool means disposed about said temperature means for controlling an area of said opening so that said constant weight flow is maintained as temperature changes, and for cooperating with said temperature means such that as said temperature means changes a given percentage, a corresponding percentage cross-sectional area of flow through said window means is changed by said spool means so that said constant weight flow is maintained; and

a means for providing a constant pressure drop across said valve means.

4,898,325

AUTOMOBILE AIR CONDITIONER WITH SEPARATE FLOW ADJUSTMENT FOR CENTRAL AND SIDE VENTS

Muneo Sakurada, Saitama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Mar. 15, 1988, Ser. No. 168,278
Claims priority, application Japan, Apr. 28, 1987, 62-105658
Int. Cl.[4] B60H *1/02, 1/34*
U.S. Cl. 237—12.3 B **1 Claim**

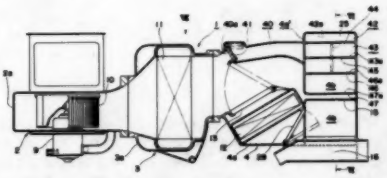
1. In an air conditioning system for an automotive vehicle having a compartment, the system having a central air outlet, and left and right air outlets respectively arranged at left and right sides of said central air outlet, said central air outlet and said left and right air outlets being provided at at least one of front and rear portions of said compartment, the improvement comprising;

central air passage means extending from a first diverging point and leading to said central air outlet;

side air passage means extending from said first diverging point in a manner separated from said central air passage means and leading to said left and right air outlets, said side air passage means having left and right air passages extending from a second diverging point which is located at a different position from said first diverging point and leading to said left and right outlets, respectively;

said first diverging point dividing air into a first part delivered into said central air passage means and a second part delivered into said side air passage means at a substantially fixed ratio;

a single flow rate ratio-adjusting means arranged at said second diverging point for adjusting the ratio between the respective flow rates of air delivered into said left and right air passages;



said second diverging point being located at a position downstream of said first diverging point in a direction in which air flows, said side air passage means having a common passage extending from said first diverging point to said second diverging point and being separated from said central air passage means;

heater means arranged upstream of said central air passage means and said side air passage means in a direction in which air flows;

mixed air-delivering means arranged between said heater means and said central air passage means and said side air passage means for delivering mixed air of cold air and warm air to the latter;

cold air-bypass passage means bypassing cold air flowing upstream of said heater means and said mixed air-delivering means around said heater means and said mixed air-delivering means, said cold air-bypass passage means having a first cold air-bypass passage leading to said central air passage means and a second cold air-bypass passage leading to said side air passage means;

a foot air outlet; and

passage means connecting between said foot air outlet and said mixed air-delivering means.

4,898,326

TRACK JOINING SYSTEM

Clarence K. Edwards, and Lawrence D. Edwards, both of Medford, Oreg., assignors to Kadee Metal Products Co., Medford, Oreg.

Continuation of Ser. No. 113,452, Oct. 28, 1987, abandoned.
This application Jan. 26, 1989, Ser. No. 302,127
Int. Cl.[4] E01B *23/00*
U.S. Cl. 238—10 E **5 Claims**

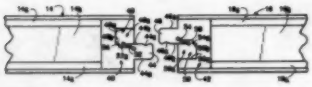
1. For a model railroad track comprising of a pair of elongate track sections disposed with one end of one track section opposite one end of the other track section, interconnecting

means detachably interconnecting the track sections comprising:

a one-piece, non-flexible socket and tongue element mounted on said one section and another one-piece, non-flexible socket and tongue element mounted on the other track section,

each of said elements including a socket portion having an outer open end disposed at the end of the track section mounting the element and the socket portion extending in an axial direction inwardly on the track section mounting the element to an inner end, and each element further including a rigid tongue portion disposed laterally of the socket portion extending in an axial direction outwardly of the track section mounting the element to a terminal end, the socket portion of each element having detachably lodged there within the tongue portion of the other element,

each socket portion and each tongue portion having opposed sides generally paralleling the axis of the track section and spaced from each other in a horizontal direction, and the socket portion sides including end expanses adjacent the inner end of the socket portion and disposed



on either side of and seating the terminal end of the tongue portion lodged within the socket portion, and the socket portion sides further including entering expanses adjacent the open end of the socket portion disposed on either side of and seating the tongue portion lodged within the socket portion, said end and entering expanses collectively inhibiting relative lateral skewing of the tongue portion within the socket portion,

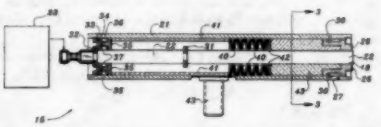
and a resilient locking spring detachably holding each tongue portion lodged within a socket portion, said spring being mounted on one of said sides of one of said portions and engageable with one of said sides of the other of the portions preventing relative axial displacement of the tongue portion relative to the socket portion, engagement with said one of said sides of the other of said portions being at a location disposed intermediate said end and said entering expanses of the socket portion, said spring being a leaf spring having an inner mounted end on said one portion and an outer free end, the leaf spring inclining extending from its inner end to its free end in the direction that said other portion moves relative to the one portion in lodging of the tongue portion within a socket portion.

4,898,327

INJECTION SYSTEM FOR FOAMABLE COMPOSITIONS

Lawrence B. Sperry, New York, N.Y., and Henry J. Ruddy, Newton, Conn., assignors to Sealed Air Corporation, Saddle Brook, N.J.

Filed Aug. 22, 1988, Ser. No. 235,064
Int. Cl.[4] B05B *15/02*
U.S. Cl. 239—1 **17 Claims**



1. An apparatus for cleaning foamable compositions from the outer exit portions of the injection nozzle of an injection system for foamable compositions, the apparatus comprising:

a tip assembly adjacent the outer portion of an injection nozzle from which foamable compositions may exit said injection nozzle, and wherein said tip assembly is porous to gases and certain liquids, but impermeable to other materials such as the foaming compositions which otherwise exit said injection nozzle; and

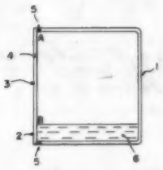
means for delivering a solvent in which foamable compositions are soluble into, then through, and then out of said porous tip assembly and adjacent said outer exit portions of said injection nozzle so that solvent which passes out of said tip assembly thereby cleans foamable compositions from said outer exit portions of said injection nozzle.

4,898,328

EMANATOR FOR VOLATILE LIQUIDS

Rodney T. Fox, Cottingham, and Philip W. Goreham, Beverley, both of Great Britain, assignors to Reckitt & Colman Products Limited, London, Great Britain

Filed Sep. 11, 1987, Ser. No. 96,116
Claims priority, application United Kingdom, Sep. 12, 1986, 8622046
Int. Cl.[4] A61L *9/04*
U.S. Cl. 239—6 **39 Claims**



1. A device for containing a volatile liquid and dispensing said liquid as a vapour which comprises a closed container having walls impermeable to said liquid and vapour and at least one wall which includes a porous support provided with at least one crosslinked organopolysiloxane material which serves to close pores in the support to prevent passage of liquid therethrough while permitting the passage of vapour.

4,898,329

APPARATUS FOR A FUEL SYSTEM

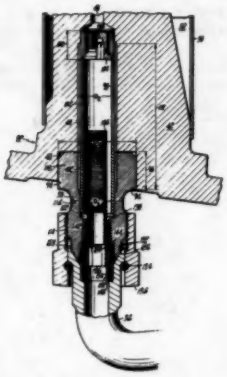
Franklin J. Davis, Glastonbury; Gilbert B. Wilcox, Somers, and Richard R. Wright, Willimantic, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 4, 1987, Ser. No. 117,117
Int. Cl.[4] B05B *1/24, 17/04*
U.S. Cl. 239—13 **11 Claims**

11. A method for shielding fuel flowing through a passage in a fuel nozzle assembly of a gas turbine engine, the passage having a longitudinal dimension, the engine having a fuel nozzle support which is attached to a casing of the engine and which has an inlet for said passage said inlet being at an upstreammost edge of said fuel nozzle support, which includes the steps of:

shielding the fuel stream with a longitudinally extending insulating gap outwardly of the passage; and,

shielding the passage with an internal insulating gap internally of the passage which longitudinally overlaps the



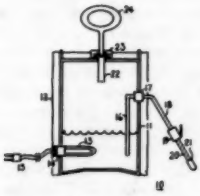
external gap and extends longitudinally to at least said upstreammost edge of the inlet to the passage.

4,898,330

PORTABLE DEICER SPRAYER

Jerry L. Betchan, 6515 Anderson Way, Nampa, Id. 83651

Filed Sep. 28, 1987, Ser. No. 102,014
Int. Cl.[4] B05B 1/24, 9/04
U.S. Cl. 239—135 1 Claim



1. Portable sprayer means for deicing of airplane wings comprising:

deicer fluid container means for pressurized holding of deicer fluid prior to delivery to the airplane surface;

manually operated air pump means for pressurizing said container means operably detachable from the container means for refilling said container means with deicer fluid;

an electrical heater means for heating deicer fluid before delivery of fluid to airplane wing surface disposed within said container means;

thermostatic control means operably connected to the electric heater to maintain a preselected deicer fluid temperature;

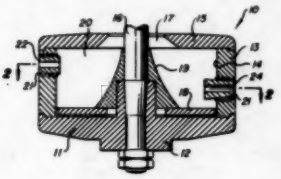
thermal insulation blanket means for removably enclosing said container.

4,898,331

ATOMIZER WHEEL WITH BUSHINGS OF DIFFERENT INWARDLY PROTRUDING LENGTHS

Ove E. Hansen, Columbia, and Christopher P. Healy, Ellicott City, both of Md., assignors to A/A Niro Atomizer, Soeborg, Denmark

Filed Dec. 22, 1988, Ser. No. 288,178
Int. Cl.[4] B05B 3/10
U.S. Cl. 239—223 26 Claims



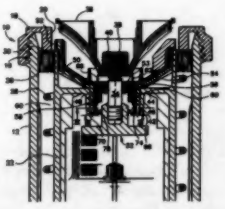
1. An atomizer wheel for atomization of slurries comprising a hub adapted for connection to a rotating drive shaft, a bottom, a substantially cylindrical side wall and a cover plate defining an annular bowl-shaped space concentric with said hub, said side wall being formed with a plurality of openings and a plurality of nozzles formed of a wear-resistant material, each of said nozzles being inserted in one of said openings with one end projecting into said bowl-shaped space a distance from said side wall and at least one of said nozzles having at least a portion of said one end projecting into said bowl-shaped space a greater distance from said side wall than at least a portion of said one end of other ones of said nozzles.

4,898,332

ADJUSTABLE ROTARY STREAM SPRINKLER UNIT

Edwin J. Hunter, 5551 Codorniz Rd., Rancho Sante Fe, Calif. 92067, and Loren W. Scott, Carlsbad, Calif., assignors to Edwin J. Hunter, Rancho Santa Fe, Calif.

Continuation-in-part of Ser. No. 121,400, Nov. 11, 1987, Pat. No. 4,842,201, which is a continuation-in-part of Ser. No. 878,591, Jun. 26, 1986, Pat. No. 4,869,379. This application Apr. 10, 1989, Ser. No. 335,848
Int. Cl.[4] B05B 3/04, 1/26
U.S. Cl. 239—240 22 Claims



1. A rotating stream sprinkler unit comprising:

a tubular housing having a central axis, an inlet, an outlet, and a flow passage communicating therebetween for conducting a stream of water from said inlet to said outlet;

orifice means at said outlet for receiving and forming said stream of water into at least one substantially arcuate primary stream directed axially outward from said outlet; and

a rotating distributor head rotatably mounted at and spaced axially outward from said outlet having a plurality of flow channels therein for receiving and forming said primary stream into a plurality of streams and directing said plural-

ity of streams outward from said axis over a predetermined area; and

means for selectively blocking a portion of said flow passage for selectively adjusting the quantity of water in said stream of water communicated to said distributor head.

4,898,333

HYDRAULIC SYSTEM FOR USE WITH SNOW-ICE REMOVAL VEHICLES

James A. Kime, and Gregory R. McMenamin, both of Columbus, Ohio, assignors to H.Y.O., Inc., Columbus, Ohio

Filed Aug. 30, 1988, Ser. No. 238,630

Int. Cl.[4] E01C *19/20*; B60P *1/16*

U.S. Cl. 239—657 18 Claims

1. In a utility vehicle of the type having an internal combustion engine and hydraulically driven implements operated when selectively actuated, with pressurized hydraulic fluid derived from a pump driven by said engine, the improved hydraulic pump comprising:

a pump housing mounted upon said vehicle, and having a pump chamber;

first and second pump gears mounted for rotation within said housing pump chamber and defining a pump suction side and a pump pressure side connectable with said implements;

connector means for connecting said first pump gear in continuous driven relationship with said engine;

suction port means for coupling said pump suction side with a hydraulic fluid reservoir retained at substantially atmospheric pressure;

a poppet valve coupled intermediate said suction port means and said pump suction side and actuable to have a closed orientation substantially blocking passage of said hydraulic fluid into said suction side to derive a cavitation mode of pump operation and actuable to have an open orientation permitting the flow of hydraulic fluid from said reservoir into said pump suction side to derive a fluid pressurizing mode of operation, said poppet valve including a poppet slidably movable between open and closed orientations within a valve chamber;

vent means for venting said pump chamber substantially to atmospheric pressure to avoid ingress of air thereinto during said cavitation mode of pump operation; and

actuator means for selectively actuating said poppet valve into said open orientation by coupling one end of said valve chamber with said pump suction side, and into said closed orientation by terminating said coupling with said suction side to permit movement of said poppet to said closed orientation.

4,898,334

ARRANGEMENT FOR SECURING A CAP TO THE END OF A SUPPORTING BODY OF A HAMMER MILL ROTOR

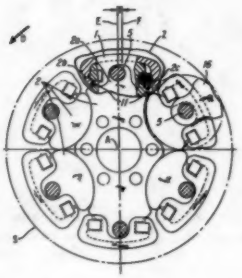
Helmut Manschwetus, Fuldabrück, Fed. Rep. of Germany, assignor to Thyssen Industrie AG Henschel, Essen, Fed. Rep. of Germany

Filed Aug. 19, 1988, Ser. No. 234,208

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1987, 3727870

Int. Cl.[4] B02C *13/04*

U.S. Cl. 241—194 2 Claims



1. In a hammer mill, an arrangement for securing a cap to the end of a supporting body of a hammer rotor that has an axis of rotation and a plurality of supporting body ends disposed next to one another and staggered in the direction of rotation of said rotor, with hammer shafts being mounted in said supporting body ends and extending parallel to said axis of rotation of said rotor over the length of said rotor, and with respective hammers and shaft-protecting members being selectively mounted, in such a way that they can swing, between each two adjacent, spaced apart supporting body ends that are disposed parallel to one another, the improvement wherein:

each of said supporting body ends has, relative to said direction of rotation of said rotor, a forward end and a rearward end, with said forward end being provided with a first front projection that is an integral part of said supporting body end and extends parallel to said axis of rotation of said rotor, and with said rearward end being provided with a recessed portion; a filler member is received in said recessed portion of said rearward end, whereby said filler member forms a second rear projection and also extends parallel to said axis of rotation of said rotor; and

said cap, relative to said direction of rotation of said rotor, has a front wall and a rear wall, with said front and rear walls being provided with respective flanges that are directed toward one another, extend parallel to said axis of rotation of said rotor, and extend in a hook-like manner about said first front projection and said second rear projection; said cap also has two side walls and covers all sides of said supporting body end while leaving free spaces between said side walls and a hammer shaft; each of said side walls has two ends, each of which is provided with an opening through one of which said filler member is inserted into said recessed portion of said rearward end, and whereby to secure said filler member in said recessed portion, and to thereby secure said cap to said supporting body end, a resilient element is introduced into said filler member and also extends into a recessed provided in an inner surface of said rear wall of said cap.

4,898,335

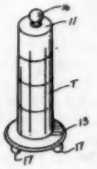
ROLL SUPPORT STAND

Ute Eyzink, 2624 Rittiner Dr., Baton Rouge, La. 70806

Filed Feb. 16, 1989, Ser. No. 310,890

Int. Cl.[4] B65H *19/00*

U.S. Cl. 242—55.42 4 Claims



1. A roll support stand for storage of an aligned column of individual rolls of webbing formed with a hollow core of a predetermined diameter, said stand comprising,

a horizontal base including a continuous arcuate perimeter,

and a counter-sunk blind bore formed medially of an upper surface of said base and extending downwardly from a top surface of said base,

and a vertical support post secured to said base orthogonally thereto and extending into said blind bore at a lowermost end of said support post,

and a securement member including a threaded shank extending through a bore directed into said blind bore wherein said threaded shank is received within a threaded bore formed in said lower end of said securement post,

and an abutment member selectively securable to an upper end of said support post of a further diameter greater than said predetermined diameter,

and wherein said support post is hollow and contains plural pairs of aligned windows diametrically opposed along said support post,

and wherein said support post further includes an adjustment rod extending medially of said support post wherein said adjustment rod is formed with a threaded lowermost end receivable within a plate, said plate extending orthogonally relative to said threaded lower end and formed with a threaded aperture threadedly receiving said threaded lower end to enable vertical repositioning of said adjustment rod relative to said hollow post.

4,898,336

APPARATUS FOR THE CONTINUOUS WINDING-UP OR WINDING-OFF OF SUBSTANTIALLY FLAT STRUCTURES INTO A PACKAGE AND FROM A PACKAGE, RESPECTIVELY

Walter Reist, Hinwil, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Mar. 2, 1988, Ser. No. 163,346

Claims priority, application Switzerland, Mar. 6, 1987, 00860/87

Int. Cl.[4] B65H *75/00, 19/12*

U.S. Cl. 242—59 15 Claims

1. An apparatus for continuous winding-up or unwinding of substantially flat structures, especially printed products in imbricated formation, selectively into a product package or from a product package, comprising:

a driven and elevationally adjustable winding core member;

a supply spool member for a winding band which is to be selectively wound-up with the substantially flat structures from which there is formed the product package or unwound together with the substantially flat structures from the product package;

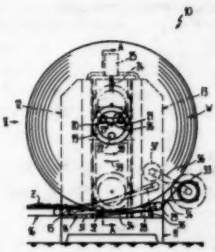
a conveyor device for the selective infeed of the substantially flat structures which are to be wound-up or the outfeed of the unwound substantially flat structures;

a conveyor band arrangement for the selective infeed of the substantially flat structures and the winding band which are to be wound-up to form the product package or for the outfeed of the substantially flat structures and the winding band which are unwound from the product package;

said conveyor band arrangement being arranged between said conveyor device and said winding core member;

said conveyor band arrangement containing at least one conveyor band trained around non-driven deflection means for entrainment in a freely revolving movement;

means for elevationally resiliently urging said conveyor band arrangement so as to contact in underfeed and from below the winding core member or the product package located upon said winding core member and thereby entrain said at least one conveyor band of said conveyor band arrangement in said freely revolving movement;



drive means for driving said winding core member;

said drive means comprising drive elements drivingly interconnecting said drive means and said winding core member;

an elevationally adjustable carriage member;

means for guiding said elevationally adjustable carriage member for movement in a substantially upright direction;

said drive means for driving said winding core member being mounted at said elevationally adjustable carriage member; and

elevational drive means for raising and lowering said elevationally adjustable carriage member and conjointly therewith said drive means and said winding core member and controllable as a function of the momentary elevational position of said conveyor band arrangement.

4,898,337

THREAD STORING AND SUPPLYING DEVICE FOR TEXTILE MACHINES, PARTICULARLY KNITTING MACHINES

Heinz Brunner, Albstadt-Ebingen, and Karl-Jürgen Sauter, Messstetten, both of Fed. Rep. of Germany, assignors to Sipra Patententwicklungs-Und Beteiligungsgesellschaft, Tailfingen, Fed. Rep. of Germany

Filed Sep. 14, 1988, Ser. No. 244,807

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1987, 3733797

Int. Cl.[4] B65H *59/22, 51/20*

U.S. Cl. 242—151 10 Claims

1. A thread braking device for thread in textile machines especially knitting machines, comprising:

a housing;

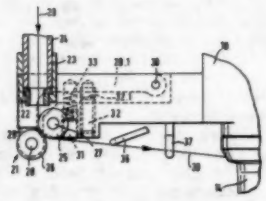
supporting means mounted in said housing so as to be movable relative to said housing;

a first roller rotatably mounted in said housing;

a second roller rotatably mounted in said supporting means parallel and spaced from said first roller and defining a gap for said thread;

a spring acting on said supporting means for urging with its spring force said second roller against said first roller;

a movable abutment associated with said supporting means and establishing a maximum value for said gap between



said rollers; and means for adjusting said spring force of said spring and said movable abutment independently of each other.

4,898,338

MAGNETIC TAPE CASSETTE

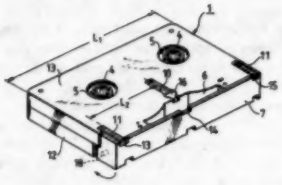
Kengo Oishi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 21, 1988, Ser. No. 247,233

Claims priority, application Japan, Sep. 21, 1987, 62-143016[U]; Sep. 21, 1987, 62-143017[U]

Int. Cl.[4] G11B *23/04*

U.S. Cl. 242—198 **9 Claims**



1. A magnetic tape cassette comprising:

a pair of tape reels on which a tape is wound;

a case in which said tape reels are rotatably mounted;

an opening disposed in front of said cassette through which said tape can be pulled out for recording and playback;

a guard panel provided at a front of said cassette for opening and closing said opening; and

at least three guide grooves provided on a bottom of said case and extending in a front-to-rear direction of said cassette at a central portion and both ends of said cassette;

wherein said guide grooves are positioned to engage insertion guides of a recording/playback apparatus and are located away from areas of rotation of said reels in directions of length, width and thickness of said cassette; and

wherein one of said guide grooves disposed at said central portion of said cassette is wider than said guide grooves disposed at said ends of said cassette, and joins a photosensor insertion hole.

4,898,339

BAIL REVERSING STRUCTURE FOR FISHING SPINNING REELS

Shinji Takeuchi, Tokyo, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan

Filed Jul. 19, 1988, Ser. No. 221,412

Claims priority, application Japan, Aug. 20, 1987, 62-126661

Int. Cl.[4] A01K *89/01, 89/04*

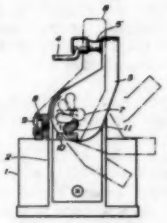
U.S. Cl. 242—231 **1 Claim**

1. A bail reversing structure for fishing spinning reels for moving a bail between a fishing line winding position and a fishing line releasing position, comprising:

an arm lever having a portion pivotally connected to a first end portion of the bail, said arm lever comprising a line roller, said arm lever having a substantially planar first surface and a second surface, said first surface being disposed further radially outwardly with respect to a rotor than said second surface;

an arm holder provided on a second end portion of the bail, said arm lever and said arm holder being mounted pivotally on bail mounting arms provided on both sides of the rotor;

an operating lever having a portion pivotally supported on a pivot axis on the bail mounting arm to which said arm lever is pivotally connected in such a manner that said operating lever can be drawn freely in a radial direction with respect to the rotor, the bail being moved between the fishing line winding position and the fishing line releasing position by turning said operating lever;



a locking projection formed on said first surface of said arm lever radially inwardly of said operating lever with respect to the rotor and extending radially outwardly from said first surface;

an arcuate engaging portion formed on a radially extending surface of said locking projection which substantially faces said pivotally connected portion of said arm lever; and

an operating projection provided on a rear side of a pivotally supported portion of said operating lever relative to the bail mounting arm, on the side of the operating lever nearest the rotor for directly engaging said engaging portion of said locking projection and extending radially inwardly of said operating lever with respect to the rotor, wherein said pivotally supported portion of said operating lever and said operating projection, in an unactuated state, are disposed on a rear side of said pivotally supported portion of said arm lever.

4,898,340

APPARATUS AND METHOD FOR CONTROLLING A CANNON-LAUNCHED PROJECTILE

Isaac E. Kliger, Lexington, and Richard A. Beckerleg, Boxford, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jan. 15, 1982, Ser. No. 339,535

Int. Cl.[4] F41G *7/00*

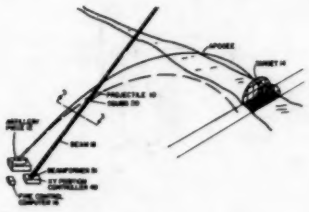
U.S. Cl. 244—3.11 **5 Claims**

1. In a system for controlling the flight of a cannon-launched projectile toward a selected target from an artillery piece, such system including a fire control computer for calculating the ideal ballistic trajectory of such projectile and a beam-forming arrangement for projecting a beam of infrared energy along the ideal ballistic trajectory from a point adjacent to the artillery piece, the improvement comprising:

(a) means for scanning the beam of infrared energy to form, in accordance with a predetermined program, a beam scan pattern and periodically to irradiate the cannon-launched projectile in flight toward the selected target;

(b) means on the cannon-launched projectile for detecting infrared energy in the beam to produce a first control signal whenever such projectile is irradiated;

(c) means on the cannon-launched projectile for reproducing the predetermined program synchronously with such program;



(d) means on the cannon-launched projectile, responsive to the first control signal and the reproduced predetermined program, for producing a second control signal indicative of the position of the cannon-launched projectile relative to the ideal ballistic trajectory; and

(e) means on the cannon-launched projectile for nulling the distance between the indicated position of such projectile and the ideal ballistic trajectory.

4,898,341

METHOD OF GUIDING MISSILES

John Terzian, Winchester, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Oct. 12, 1988, Ser. No. 256,511

Int. Cl.[4] F41G 7/22

U.S. Cl. 244—3.16 **7 Claims**

1. A method for deriving guidance signals in the terminal phase of an intercept of a target by a guided missile equipped with an imaging IR seeker, the target being of an extended area and being characterized by a thermal signature indicative of distribution of point sources of IR energy differing substantially from the distribution of point sources of IR energy in the background of the target and the imaging IR seeker being adapted, as the guided missile nears the target, sequentially to form at known intervals of time, a plurality of frames in each of which frames at least a portion of an image of the target appears, thereby providing a set of signals that creates a rectangular MxN pixel matrix of the frame, the changes from frame to frame of the rectangular MxN pixel matrix indicative of the guidance commands to be derived, the method comprising the steps of:

(a) generating, from the set of signals in the first formed one of the plurality of frames, the thermal signature of the target;

(b) selecting a first portion of the thermal signature to serve as a tracking point for the imaging IR seeker and a second portion removed from the first portion to serve as an aiming point for the guided missile;

(c) measuring a first angular displacement between the tracking point and the aiming point and storing a first signal representative of the first angular displacement;

(d) generating, using the set of signals and the stored first signal, guidance commands to maintain tracking of the tracking point by the imaging IR seeker and aiming of the guided missile at the aiming point;

(e) repeating steps (a), (b) and (c) using the set of signals in the next formed one of the plurality of frames to obtain a second signal representative of angular displacement, measured from the tracking point, between the tracking point and the aiming point at a later instant in time;

(f) comparing the first and the second signal to determine a third signal representative of the rate of growth of the angular displacement between the tracking point and the aiming point;

(g) modifying the guidance commands in accordance with the third signal to maintain tracking of the tracking point by the imaging IR seeker and aiming of the guided missile at the aiming point.

4,898,342

MISSILE WITH ADJUSTABLE FLYING CONTROLS

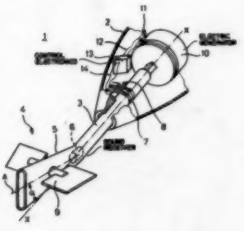
Walter Kranz, Taufkirchen, and Werner Schnibele, Wolfratshausen both of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 13, 1988, Ser. No. 283,628

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1987, 3742836

Int. Cl.[4] F42B 15/02

U.S. Cl. 244—3.21 **9 Claims**



1. A missile with target sensor means comprising:

adjustable flight control means;

electric generator means having a rotor and a stator, the rotor and stator being mounted on two sections of the missile capable of rotary movement relative to one another, the rotor being mechanically coupled to the adjustable flight control means;

variable electric load means coupled to the electric generator means for providing variable electric resistance; and

control electronic means coupled to the target sensor means and the variable electric load means, the control electronic means receiving target location signals from the target sensor means and altering the variable electric load in response to the target location signals, the changes in electric load varying the rotational speed of the rotor which in turn varies the rotational rate of the adjustable flight control means, resulting in an altered flight path.

4,898,343

THRUST-DEFLECTING VANE DEVICE OF V/STOL AIRCRAFT

Keisuke Kamo, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1988, Ser. No. 286,806

Claims priority, application Japan, Dec. 25, 1987, 62-328887

Int. Cl.[4] B64C *29/00*

U.S. Cl. 244—12.4 **5 Claims**

3. A thrust-deflecting vane device of a vertical/short take-off and landing (V/STOL) aircraft having an airframe and a jet engine which discharges an exhaust gas stream, comprising:

tail surfaces being provided at an aft part of said airframe; and

a tail surface deflecting device intercoupling said tail surfaces with said airframe and being operable to move said tail surfaces selectively between first positions on the outer lateral sides of said airframe and second positions in said exhaust gas stream, said tail surface deflecting device including a universal joint mechanism.

4,898,344

HYDRAULICALLY OPERATED WINCH UNITS

Thomas M. Craig, Loanhead, Scotland, assignor to MacTaggart, Scott (Holdings) Ltd., Loanhead, Scotland

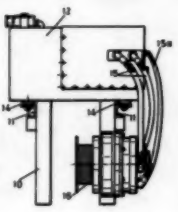
Filed Jun. 6, 1988, Ser. No. 202,897

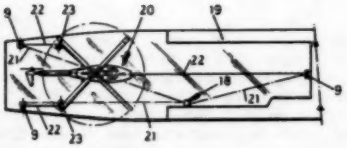
Claims priority, application United Kingdom, Jun. 9, 1987, 8713423

Int. Cl.[4] B64F *1/12*

U.S. Cl. 244—116 **9 Claims**

1. An aircraft handling system comprising a plurality of hydraulically operated winches, each winch having a wire for connection to the aircraft, and each winch having a dedicated hydraulic pumpset positioned in proximity thereto; an electrical control unit for effecting co-operating operation of the winches in order to effect the desired movement and control of the aircraft; means for detecting the tension in the wire of at least one of said winches and transmitting an electrical signal in response thereto to said control unit; and means for transmitting an electrical signal from the control unit to the other winch or winches in order to control the tension in their wires in relation to the wire tension of said one winch.





4,898,345

SKYBOARD

Dan Clayton, 8651 Foothill, No. 42, Rancho Cucamonga, Calif. 91730

Filed Oct. 24, 1988, Ser. No. 261,697

Int. Cl.[4] B64C *31/00*; B64D *17/78*

U.S. Cl. 244—4 A **17 Claims**

1. A skyboard, comprising:

a. a main body having an upper surface, a lower surface, a first lateral side, a second lateral side, a front nose and a transverse rear edge;

b. a pair of spaced apart generally parallel fins attached to the lower surface of the main body and extending for a portion of the length of the lower surface;

c. a first front wing attached to the first lateral side of said main body and extending transversely therefrom;

d. a first rear wing attached to the first lateral side of said main body and extending transversely therefrom;

e. a second front wing attached to the second lateral side of said main body and extending transversely therefrom;

f. a second rear wing attached to the second lateral side of said main body and extending transversely therefrom;

g. a pair of shoe bindings attached to the upper surface of said main body;

h. said main body further comprising a parachute compartment;

i. a closed parachute within said parachute compartment and attached to said main body; and

j. triggering means by which said parachute is released from said parachute compartment and caused to open.

4,898,346

RESERVE PARACHUTE PACK WITH PILOT CHUTE

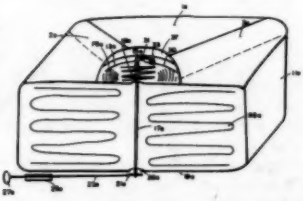
Stefan Ertler, Letzenbergstrasse 50, D-6914 Malschenberg, Fed. Rep. of Germany

Filed Feb. 8, 1989, Ser. No. 307,715

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1988, 3805085

Int. Cl.[4] B64D 17/70

U.S. Cl. 244—148 **20 Claims**



1. A parachute pack, comprising:

a reserve parachute folded into an undeployed condition;

a covering for said reserve parachute substantially enclosing said reserve parachute in its undeployed condition;

a pilot chute folded into an undeployed condition and overlying said folded reserve parachute;

means for deploying said pilot chute including a cover outside said covering for said reserve parachute, a compression spring located outside said covering and engageable with said cover, and an element attached to said cover and extending through said folded pilot chute, said folded reserve parachute and said covering, said element being secured to said cover substantially at its center and extending substantially centrally through said compression spring;

said deploying means further including means for releasably securing said element to the side of the reserve parachute's covering opposite said cover to maintain said compression spring in a compressed condition whereby, upon release of said securing means, said compression spring may extend to displace said cover and free said folded pilot chute for deployment.

4,898,347

METHOD FOR CLEANING SPACECRAFT CRITICAL SURFACES

Maurice P. Bianchi, Palos Verdes Estates, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Division of Ser. No. 34,252, Apr. 6, 1987, Pat. No. 4,836,860. This application Oct. 17, 1988, Ser. No. 259,022

Int. Cl.[4] B64G 9/00

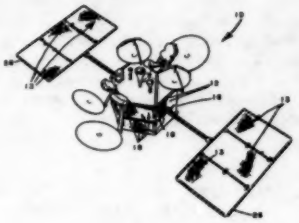
U.S. Cl. 244—158 R **13 Claims**

1. In combination

means having a pristine surface to be placed in an outer space environment,

a protective coating on said pristine surface which sublimes in said outer space environment, whereby contaminants which would otherwise deposit on and contaminate said surface deposit instead on said coating, and

wherein said protective coating and any contaminants thereon are eliminated from said surface in said outer space environment by sublimation of said coating, thereby



to expose said surface in its pristine state to said outer space environment.

4,898,348

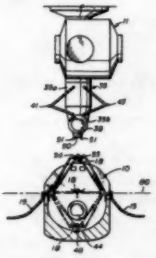
DOCKING SYSTEM FOR SPACECRAFT

Jon B. Kahn, League City, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 30, 1988, Ser. No. 292,121

Int. Cl.[4] B64G 1/64

U.S. Cl. 244—161 **11 Claims**



1. A docking mechanism for the coupling and docking of a space vehicle with a space station which is provided with an egress hatch, said docking mechanism comprising:

a pressurizable tunnel structure attached at one end to said space station in sealing engagement therewith about said egress hatch, said tunnel structure providing a passageway of a size sufficient for accommodating the passage of personnel and equipment;

a passive docking ring affixed to said tunnel structure at a location thereon remote from said one end;

an active docking ring mounted on said space vehicle;

actuator means for moving said active docking ring between a stowed retracted position in the payload bay of the spaced vehicle to a fully deployed position outside said space vehicle wherein said active docking ring is disposed for coupling engagement with the passive docking ring in the space station when the space vehicle makes an aligned docking approach to the space station, said actuator means

being responsive to the docking impact of said space vehicle with the space station to attenuate the shock forces of said impact and after completing engagement retracting the docket and assembly;

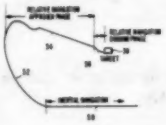
and means responsive to retraction of the active docking ring after coupling engagement of said docking rings for establishing a structural tie between said space vehicle and space station and sealing connection of said tunnel structure with said space vehicle for establishing a passageway for the passage of personnel and equipment between the space vehicle and space station.

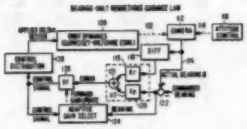
4,898,349

SPACECRAFT APPROACH/SEPARATION BY USE OF ANGULAR MEASUREMENT

Paul A. Miller, East Windsor, N.J., assignor to General Electric Company, East Windsor, N.J.

Filed Dec. 9, 1988, Ser. No. 282,161
Int. Cl.[4] B64G *1/24*
U.S. Cl. 244—161 **11 Claims**





1. A spacecraft guidance and control system for approach-/separation relative to a target, both of which are in substantially mutually coplanar orbits about a heavenly body, said spacecraft comprising:

first attitude determining means for determining the direction of a radius from the center of gravity of said body to at least one of said spacecraft and said target;

second attitude determining means for determining a direction parallel with at least one of said coplanar orbits and normal to said direction of said radius;

sensing means coupled to said second attitude control means for sensing the angle in said plane between said direction and a line joining said target with said spacecraft; and

propulsion means coupled to said sensing means for generating propulsion tending to maintain said in-plane angle at a constant value.

5. A method for controlling the approach or separation of a spacecraft in a first orbit about a heavenly body relative to a target in a substantially coplanar second orbit, said method comprising at least the steps of:

determining the direction of a radius from the center of gravity of said body to at least one of said spacecraft and said target;

determining a second direction substantially parallel with one of said mutually coplanar orbits and normal to said direction of a radius;

observing the angle between said second direction and a line joining said target with said spacecraft; and

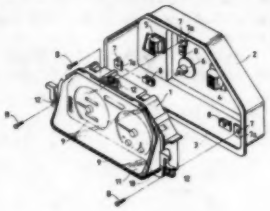
propelling to at least tend to maintain said angle constant.

4,898,350

VEHICLE-METER-HOUSING MOUNTING BRACKETS

Takahiro Masuda, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Oct. 12, 1988, Ser. No. 256,798
Claims priority, application Japan, Oct. 12, 1987, 62-155732
Int. Cl.[4] G12B *9/00*
U.S. Cl. 248—27.1 **5 Claims**



1. A vehicle meter housing structure comprising:

an instrument panel having a front opening portion;

a meter housing inserted into said instrument panel through said front opening portion;

a pair of mounting brackets formed on a periphery of said meter housing; and

a pair of lugs, each of said lugs extending forwardly from one of said mounting brackets;

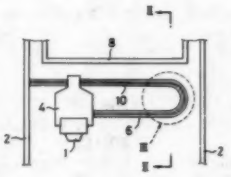
wherein each of said lugs has a small width portion which provides a gap large enough to receive human fingers between an inner edge of said instrument panel and said lug.

4,898,351

MECHANISM FOR SUPPORTING A LONG FLEXIBLE ELEMENT

Norio Suzuki, Tokyo, Japan, assignor to Juki Corporation, Chofu, Japan

Filed Dec. 22, 1988, Ser. No. 289,556
Claims priority, application Japan, Dec. 25, 1987, 62-329315
Int. Cl.[4] F16L *3/00*
U.S. Cl. 248—51 **16 Claims**



1. A mechanism for supporting a long flexible cable having at least one end which is attached to a movable member which travels substantially longitudinally and reciprocally, comprising:

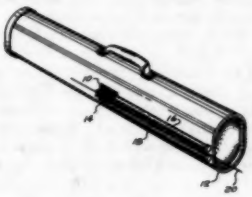
a long tape whose transverse section is curved outwardly or inwardly with constant curvature, said tape being placed along the length of said cable and in contact therewith in a manner supporting said cable and causing said cable to maintain a uniform angle of curvature at its point of turn back substantially throughout the travel of said member.

4,898,352

CONTAINER STAND

Ronald W. Hoffman, 10431 West Catalina, Phoenix, Ariz. 85039

Filed Feb. 13, 1989, Ser. No. 309,217
Int. Cl.[4] A63B 55/00
U.S. Cl. 248—96 **7 Claims**



1. A supporting apparatus for attachment to an object to selectively position said object in an upright orientation, said supporting apparatus comprising:

(a) a bracket including

(i) a planar attachment plate attachable to said object, said attachment plate defining a weight supporting line, and

(ii) a planar attachment support perpendicularly and rigidly attached to said planar attachment plate;

(b) a rotating member pivotably attached to said attachment support, said rotating plate comprising

(i) a planar rotating support coplanar with said planar attachment support, and

(ii) a planar rotating plate perpendicularly and rigidly attached to said planar rotating support,

said rotating member being disposed for rotation from a first position in which said rotating plate is generally coplanar with said planar attachment plate to a second position in which said rotating plate forms an angle with said attachment plate;

(c) a first leg movably coupled to said rotating plate so that said first leg selectively resides in one of a first position generally parallel to said weight supporting line and a second position at an acute angle to said weight supporting line; and

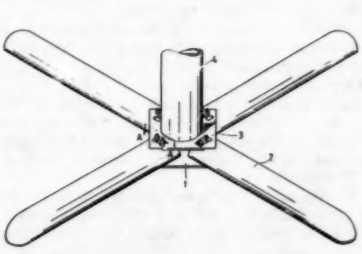
(d) a second leg movably coupled to said rotating plate so that said second leg selectively resides in one of a first position generally parallel to said weight-supporting line and a second position at an acute angle to said weight-supporting line, said second leg being at an angle with said first leg when said first and second legs are in said second positions.

4,898,353

BUILT-UP STAND

Ronald R. H. Jih, 26, Lane 378, Chung Shan Road, Lu Liao District, Sha Lu Chen, Taichung Shien, and Jing-Shuen Chi, 8, Lane 280, Jen Shing Road, Taichung City, both of Taiwan

Filed May 16, 1989, Ser. No. 352,298
Int. Cl.[4] A47B 91/00
U.S. Cl. 24.8—188.7 **3 Claims**



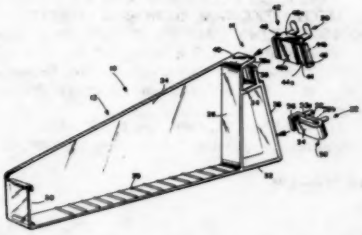
1. A built-up stand comprised of a bottom holder plate, a plurality of base elements and an upper holder plate, wherein the upper holder plate is comprising plurality of fastening holes made thereon with two retainer means integrally made at both sides of each of the fastening holes; the base elements each having a recessed front end to form into a plane which is including a fastening hole with two retainer holes set at both lateral sides, and also comprising a hollow stub set below its fastening hole; the bottom holder plate having a plurality of fastening holes made thereon to match with the fastening holes of the upper holder plate, with a locating plate respectively set at the left, right and inner side of each the fastening hole of the bottom holder plate to let the three locating plates which encircle the fastening hole of the bottom holder plate define a space just suitable for setting therein of the hollow stub of the base element, and wherein when the bottom holder plate, the base elements and the upper holder plate are attached together, the fastening holes of the bottom holder plate, the base elements and the upper holder plate are arranged to aim at one another, to allow a bolt screw means to screw thereinto and to further be fastened up with a wing nut.

4,898,354

PEG BOARD DISPLAY BRACKETS

Paul S. Whittington, Thornhill, and James Morison, Oshawa, both of Canada, assignors to Gorrie Advertising Management Limited, Mississauga, Canada

Continuation-in-part of Ser. No. 191,537, May 9, 1988, Pat. No. 4,817,900. This application Jan. 4, 1989, Ser. No. 293,421
Int. Cl.[4] F16B 5/06
U.S. Cl. 248—225.1 **8 Claims**



1. A bracket for supporting a product on a display panel having a number of regularly spaced passages defined therein, said bracket comprising:

a body with a surface to carry said product, said body having a support assembly integrally formed therewith to support said surface in position against said display panel;

a first anchor portion for removable connection with said support assembly; said first anchor portion including a base, a pair of hook elements extending outwardly from said base and dimensioned to engage a corresponding pair of said passages; a hook mounting web extending outwardly form said base,

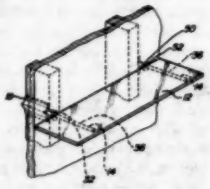
said support assembly including a first support flange and a second support flange extending outwardly from said body; said first support flange having an end which is spaced a distance from an adjacent end of said second support flange, said hook mounting web is dimensioned for a sliding engagement between said adjacent ends.

4,898,355

SHELF SUPPORT FOR GLASS SHELVING

Steven Steinway, 5582 Greenbriar Dr., West Bloomfield, Mich. 48322

Filed Jan. 17, 1989, Ser. No. 297,173
Int. Cl.[4] A47G 29/02
U.S. Cl. 248—235 13 Claims



1. A mounting structure for supporting glass shelving comprising:

(a) an attachment bracket, the attachment bracket adapted to be mounted normal to a wall plane; the attachment bracket comprising a pair of legs, each leg having at least one mounting flange having at least one mounting hole formed therein, the legs being angularly inclined with respect to each other and terminating at an apex, the apex having an inner surface comprising an elongated hollow area;

(b) a supporting member, the support member being sized to be received and secured in the hollow area such that when secured the support member will extend therefrom normal to the wall plane and in a plane parallel to the attachment bracket; and,

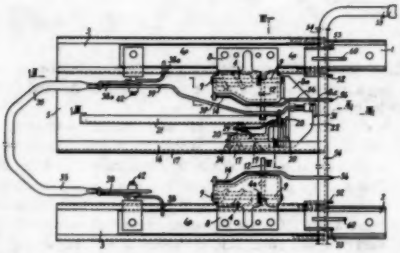
(c) fastening means for securing the bracket to a support surface, the fastening means being projectable through the mounting hole.

4,898,356

REVERSIBLE ENDLESS SCREW SLIDES AUTHORIZING A MICRO MILLIMETRIC CONTROLLED DISPLACEMENT AND INCLUDING A MEMORY FOR A VEHICLE SEAT

Yves Pipon, and Georges Droulon, both of Flers, France, assignors to A. & M. Cousin Etablissements Cousin Freres, Flers, France

Filed Nov. 18, 1988, Ser. No. 273,419
Claims priority, application France, Nov. 20, 1987, 87 16103
Int. Cl.[4] B60N 1/04
U.S. Cl. 248—429 2 Claims



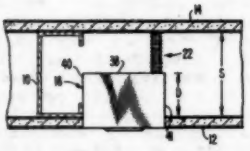
1. Reversible endless screw slides enabling a micro-millimetric displacement and including a memory for a vehicle seat in which two parallel slides (1,2), each constituted by a lower fixed element (3) and an upper mobile element (6), are fixed by their lower fixed elements (3) to the vehicle floor via a base plate (5), one (1) of the slides having on a lower vertical portion (3*a*) of the lower fixed element (3) a rack (3*b*) cooperating with a first reversible endless screw (4) freely mounted on a pin (9) fast with a box (8) fixed on an upper portion of the upper mobile element (6) for controlling a displacement of the slides (1, 2), locking means of the first endless screw (4) by a first shoe (11) being provided through action of a first lever (12), wherein the base plate (5) is mounted under at least one of the two slides and carries also, between the two slides (1, 2), a profile section (16) forming a second rack cooperating with a second reversible endless screw (19) and which can be locked by a second shoe (26), movement of the second shoe being controlled by a second lever (28), the first and second levers (12 and 28) being able to pivot against action of springs (14, 29) via a third lever (39) fast with an articulated control bow (35) placed between the two slides (1, 2) so as to free the first endless screw (4) locking the slides (1, 2) and the second endless screw (19) placed in a casing (20) and cooperating with the second rack for forming a slide mechanical memory; both the box (8) and the casing (20) carrying abutment parts (8*a*, 22, 8*c*, 31) so as to bring in coincidence a position of the box (8) controlling the displacement of the slides (1, 2) with the casing (20) constituting the slide mechanical memory, a fourth lever (56) being mounted on a shaft (54) controlling an unlocking of the first lever (12) and therefore of the first endless screw (4) and enabling to displace the upper mobile elements (6) of the slides without changing a position of the casing (20) constituting the slide mechanical memory.

4,898,357

ELECTRICAL BOX SUPPORT

Robert W. Jorgensen, Niles, Mich., and Kenneth R. Schnell, South Bend, Ind., assignors to Hubbell Incorporated, Orange, Conn.

Filed Dec. 15, 1988, Ser. No. 284,553
Int. Cl.[4] H02G 3/12
U.S. Cl. 248—906 7 Claims



1. A support structure for an electrical box of the type having a back wall, first and second generally parallel side walls, an open front and means for mounting the box with the first side wall against a stud and with the back wall extending away from the stud between two generally parallel sheets of wall material, the depth of said box in the direction perpendicular to said sheets of wall material being significantly less than the distance between the inner surfaces of said sheets of wall material, the support structure comprising

means defining a hole of preselected size through said back wall significantly closer to said second side wall than said first side wall; and

a support member comprising

an elongated body of electrically nonconductive material having retainer means at one end dimensioned to be pushed into said hole in said back wall for holding said body on said box extending perpendicularly rearwardly therefrom,

a stop flange adjacent said retainer means for abutting an outer surface of said back wall of said box and establishing a depth to which said retainer means extends into said box, and

means defining a plurality of recesses substantially uniformly spaced along said body from the other end thereof to a location near said stop flange, said recesses

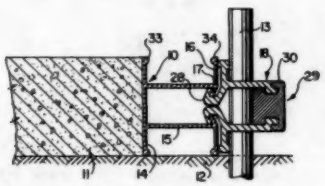
forming weakened regions at which said body can be broken to remove a portion of said body of selected length and to thereby reduce the length of said support member to a length, measured between the remaining end thereof and said stop flange, which is substantially equal to the difference between the depth of the box and the distance between the inner surfaces of said sheets of wall material, thereby forming a support to restrict movement of said box between said sheets of wall material.

4,898,358

FORM-WORK FOR CONCRETE

John R. Sproule, Suite 103, 1400 Kensington Road, N.W., Calgary, Alberta T2N 3P9, Canada

Filed Nov. 29, 1988, Ser. No. 277,253
Int. Cl.[4] E01C 7/00
U.S. Cl. 249—7 **9 Claims**



1. Concrete form-work which comprises:

(a) an edge beam comprising an elongated edge plate having a front face and a rear face, a pair of web portions projecting outwardly from said rear face with a vertical space therebetween and a flange member joined to the free end of each web portion, each flange member including a plate portion extending outwardly relative to the vertical space between the web portion and substantially parallel to said edge plate and a lip portion extending inwardly into said vertical space,

(b) a pair of connector members each comprising a plate with a hole for receiving a stake, an off-set wedge-receiving flange at one edge of the plate and a connector flange at the opposite edge of the plate, each said connector flange including a J-shaped hook portion for hooking around each said edge beam flange lip and an abutment face for engaging a stake and

(c) a wedge member for engaging the off-set flanges of said pair of connector members to hold the connector members and force the connector member abutment faces into tight engagement with the stake.

4,898,359

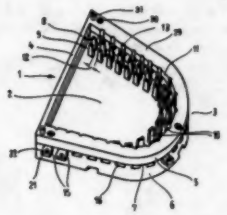
BASE FOR HOLDING A PLASTER OF PARIS MODEL OF A SET OF TEETH

Günter Gopon, Karlsruhe, Fed. Rep. of Germany, assignor to Karsten Baumann, Muhlacker, Fed. Rep. of Germany

Filed May 12, 1988, Ser. No. 193,009
Claims priority, application Fed. Rep. of Germany, May 14, 1987, 3716143
Int. Cl.[4] A61C 11/00
U.S. Cl. 249—54 **12 Claims**

11. Casting apparatus for the production of dentures, comprising:

a base for holding a plaster of paris model of a set of teeth for the production of said dentures, the base including a bottom to which is attached an upright, circumferential U-shaped exterior wall having an interior surface and perpendicularly projecting guide elements for the plaster of paris model, wherein said guide elements include a first U-shaped curved row of spaced, juxtaposed, frustum configured pins extending parallel to the interior surface of said exterior wall, and



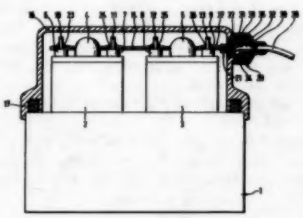
a casting box having a cover and a side wall depending from said cover, said side wall being configured for abutting said exterior wall.

4,898,360

VALVE BLOCK ASSEMBLY

Holger VonHayn, Bad Vilbel, and Joachim Maas, Griesheim, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt Am Main, Fed. Rep. of Germany

Filed Dec. 7, 1988, Ser. No. 281,312
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1987, 3742830
Int. Cl.[4] F16K 31/02
U.S. Cl. 251—129.01 **5 Claims**



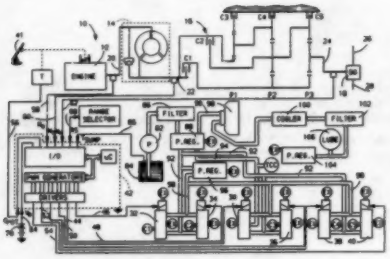
1. A valve block assembly comprising, in combination: a housing enclosing a portion of said valve block assembly, one or more electromagnetically actuable hydraulic valves, a value cap, a power supply means for applying electric power to the coils of the electromagnetic valves through a plurality of electrical contact points, wherein a printed circuit board is provided which is mountable on all of said electrical contact points of the coils as one component unit, and including electrical tracks to establish electrical connections between the coils and an outgoing cable of the valve block, wherein the printed circuit board includes a contact means for an output cable common to all tracks, which contact means is configured so that a removable plug contact of the connecting cable is directly plugged over an edge portion of the printed circuit board forming part of the contact means and a projection of said housing extending away from said edge portion and generally parallel to said printed circuit board for receiving and supporting said plug contact.

4,898,361

SUBMODULATION OF A PULSE-WIDTH-MODULATED SOLENOID CONTROL VALVE

James G. Bender, Carmel, Ind.; Lee F. Herron, Santa Barbara, Calif., and Keith D. Struthers, Carmel, Ind., assignors to General Motors Corporation, Detroit, Mich. and Delco Electronics Corporation, Kokomo, Ind.

Filed Apr. 28, 1989, Ser. No. 345,054
Int. Cl.[4] F16K *31/06*
U.S. Cl. 251—129.05 **3 Claims**



1. Fluid pressure control apparatus for generating a desired fluid pressure in a control chamber of a motor vehicle transmission, comprising:

a source of fluid pressure;

electrically energizable solenoid operated valve means adapted to alternately connect and disconnect said source and said control chamber in accordance with such energization;

a source of direct voltage including a storage battery, having a terminal voltage which varies depending on vehicle operation;

control means for (1) developing a relatively low frequency PWM valve energization signal having an on-time/off-time duty cycle which if applied to the valve would produce the desired pressure in said control chamber when the terminal voltage of said source is relatively low, and (2) submodulating the on-time of said energization signal in relation to the actual terminal voltage of said source so as to effectively reduce said on-time when the actual source voltage is greater than said relatively low source voltage; and

driver means for energizing the solenoid operated valve means with said source of direct voltage in accordance with the submodulated valve energization signal.

4,898,362

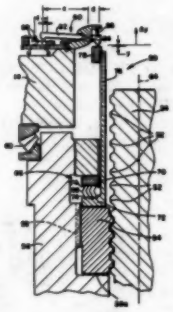
THRUST ACTUATED CONTROL FOR MOTOR OPERATED VALVE

Robert L. Leon, Roslyn, Pa., assignor to Liberty Technology Center, Inc., Conshohocken, Pa.

Filed Jan. 31, 1989, Ser. No. 304,983
Int. Cl.[4] F16K *31/04*
U.S. Cl. 251—129.12 **4 Claims**

1. In a motor operated valve, having a motor operator including motor drive means having a motor, a worm, a worm gear and a drive sleeve, a stem nut coupled to and surrounded by the drive sleeve for rotation about an axis and stem nut lock means coupled to the drive sleeve for preventing axial movement of the stem nut, the valve including a valve gate, a valve seat and a valve stem coupled to the valve gate, the valve stem threadingly engaging the stem nut for axial movement in a first direction upon rotation of the stem nut in a first direction to move the valve gate toward and into engagement with the valve seat and for axial movement in a second direction upon rotation of the stem nut in a second direction to move the valve gate out of engagement with and away from the valve seat, wherein the improvement comprises:

a thrust actuated control including thrust sensor means comprising a mechanical spring assembly positioned between the stem nut and the stem nut lock means for facilitating and sensing axial displacement of the stem nut in the second axial direction resulting from axial compressive thrust on the stem and for returning thrust from the stem



nut directly to the drive sleeve so that the force path beyond the drive sleeve is the same as it would have been without the thrust sensor means; and

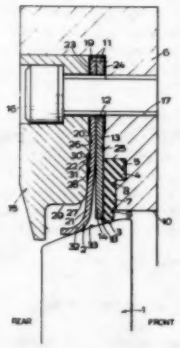
switch means operatively coupled with the thrust sensor means and with the motor for actuation to stop the operation of the motor to stop rotation of the drive sleeve and the stem nut when the axial displacement of the stem nut exceeds a predetermined limit proportional to a predetermined compressive thrust on the stem.

4,898,363

BUTTERFLY AND BALL VALVES

Philip J. Burton, Great Barr, England, assignor to Charles Winn (Valves) Limited, Birmingham, England

Filed Jun. 8, 1989, Ser. No. 363,542
Claims priority, application United Kingdom, Jun. 10, 1988, 8813832; Jul. 21, 1988, 8817411
Int. Cl.[4] F16K *1/22*
U.S. Cl. 251—173 **9 Claims**



1. A fluid flow valve comprising a valve body provided with a fluid flow passage, a valve member pivotally mounted in said passage for rotation about an axis extending substantially transversely of said passage, an annular seal assembly carried by

said body and encircling said fluid flow passage, an edge of said valve member presenting a seal engaging surface which sealingly engages with said seal assembly at least in the closed condition of said valve member to close said flow passage in that condition, said seal engaging surface tapering radially inwardly of the valve from a front to a rear of said valve member, said seal assembly comprising a polymeric sealing ring which is arranged normally to provide a first sealing engagement with said valve member, at least in the closed condition of said valve member, a substantially flat energiser ring which comprises a radially outer portion secured to said housing and a radially inner portion which abuts with said polymeric sealing ring, said energiser ring and polymeric sealing ring having dimensions chosen such that said energiser ring permanently exerts a force on said polymeric ring in a direction towards said front of said disc to urge said polymeric ring against a rearwardly facing abutment surface on said valve housing, said seal assembly further comprising a metal seat ring which provides a permanent resiliently biassed second sealing engagement with said valve member at a radially inner margin of said metal seat ring, and which comprises a radially outer metal seat ring portion which is sealingly held to said valve housing, the arrangement being such that the resilient loading exerted by said energiser ring on said polymeric seat is substantially independent of the resilient loading exerted on said valve member by said metal seat ring.

4,898,364

TWO-SPEED WINCH

Brian Shuker, Portsmouth, and Richard D. J. Huggett, Horndean, both of United Kingdom, assignors to Lewmar Marine Limited, Havant, England

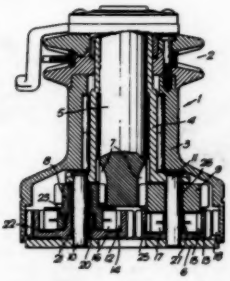
Filed Oct. 6, 1983, Ser. No. 539,407

Claims priority, application United Kingdom, Oct. 8, 1982, 8228815; Dec. 30, 1982, 8237000

The portion of the term of this patent subsequent to Jan. 9, 2007, has been disclaimed.

Int. Cl.[4] B66D *1/14*

U.S. Cl. 254—342 **8 Claims**



1. A manually powered winch having an input drive shaft and a winch drum, there being only two geared drive trains between the input drive shaft and the drum, an annular gear track on an inner wall of the drum, a unidirectional gear borne on an axle in the winch, the unidirectional gear comprising two parts, a first of said two parts comprising gear teeth engaging with the gear track and a hub joined to the gear teeth, the said first part being the final drive to the gear track from both said geared drive trains, the gear teeth of the first part being permanently engaged by teeth of a gear of one of the drive trains, and means being provided whereby the first part is also engageable by a second part of the said two parts of the unidirectional gear, the said second part being borne by a portion of the hub of the first part for rotation about that portion and the axle, and unidirectional drive means between the said first and second parts, the said second part having gear teeth being a member of the other of the said drive trains.

4,898,365

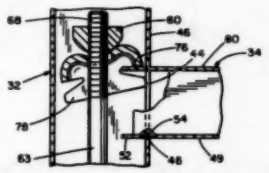
MODULAR BARRIER

John P. Conner, Grandville, and James R. Bouse, Belmont, both of Mich., assignors to Allied Tube & Conduit Corporation, Harvey, Ill.

Filed Aug. 20, 1987, Ser. No. 87,414

Int. Cl.[4] E04H *7/14*

U.S. Cl. 256—65 **17 Claims**



1. A modular barrier comprising:

a pair of spaced, vertical metallic tubular posts each having a facing vertical wall, each said vertical wall having an upper window and a lower window, each said vertical wall further including an upper tongue extending upwardly into said upper window and a dependent lower tongue extending into said lower window;

an upper tubular metallic rail extending between said posts;

a lower tubular metallic rail extending between said posts with said rails being parallel and having facing inside walls and outside walls, each said rail having a first end disposed inside one of said posts and a second end disposed inside the other of said posts, each of said facing inside walls having an indentation adjacent each said end receiving a corresponding one of the tongues, each of said windows being sized to receive its corresponding rail ends; and

holding means pushing said rails towards each other and disposed inside each of said posts, each of said holding means engaging said outside walls of said rails and pushing each of said rails toward the other of said rails whereby said tongues are held in their corresponding indentations to maintain said posts and said rails assembled, and the rails are moved toward each other by the holding means so that said rails are firmly secured, said rail ends extending less than halfway through said costs, each of said holding means being disposed entirely within its corresponding post.

4,898,366

APPARATUS FOR CHARGING A MELTING GASIFIER WITH GASIFICATION MEDIA AND SPONGE IRON

Bogdan Vuletic, Duesseldorf, Fed. Rep. of Germany, assignor to Deutsche Voest-Alpine Industrieanlagenbau GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Jul. 8, 1988, Ser. No. 216,729

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1987, 3723137

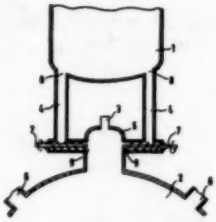
Int. Cl.[4] F27B *1/20*

U.S. Cl. 266—160 **4 Claims**

1. The combination of a direct reduction furnace, a melting gasifier and apparatus for charging the melting gasifier with sponge iron from the direct reduction shaft furnace arranged above the melting gasifier comprising:

a plurality of connecting means symmetrically arranged about a vertical longitudinal axis of the melting gasifier, each connecting means comprising a conduit having an inlet end connected to a lowermost end of the direct reduction shaft furnace, a substantially vertical portion of

the conduit connected to the inlet end and extending downwardly therefrom, a substantially horizontal portion of the conduit having a first end connected to a lowermost end of the vertical portion and a second end, and an outlet connecting the second end of the conduit to an upper portion of the melting gasifier;



a discharge means situated within each of the horizontal portions of the conduits for assisting in delivering sponge iron from the lower end of the vertical portion of the connecting means to the outlet; and

a gasification media inlet, situated on the longitudinal axis of the melting gasifier, adjacent to and centrally situated between the outlets of the plurality of connecting means.

4,898,367

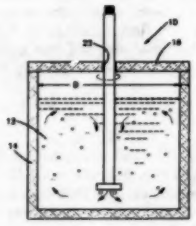
DISPERSING GAS INTO MOLTEN METAL

Paul V. Cooper, Chesterland, Ohio, assignor to The Stemcor Corporation, Cleveland, Ohio

Filed Jul. 22, 1988, Ser. No. 222,934

Int. Cl.[4] C21C 7/00

U.S. Cl. 266—216 **10 Claims**



1. Apparatus for dispersing gas into molten metal, comprising:

an impeller in the form of a rectangular prism having upper and lower faces, a width (A), a depth (B), and a height (C), with (A) being equal to (B), the impeller having a gas discharge outlet opening through the lower face of the prism;

an elongate, rotatable shaft rigidly connected to the impeller and projecting from the upper face of the impeller; and

means for conveying gas to the gas discharge outlet, whereby gas to be dispersed into molten metal can be pumped along the lower face of the impeller.

4,898,368

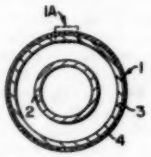
WEAR RESISTANT METALLURGICAL TUYERE

Paul J. Schaffer, Peekskill, N.Y., and Robert C. Tucker, Jr., Brownsburg, Ind., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Aug. 26, 1988, Ser. No. 236,788

Int. Cl.[4] C21C 5/48

U.S. Cl. 266—222 **12 Claims**



6. A metallurgical vessel comprising at least one refractory wall and having at least one coaxial tuyere passing through said wall for passage of fluid into the vessel, said tuyere comprising a central conduit and at least one conduit outer and coaxial thereto, each of said conduits having an outer surface and further comprising an oxide thermal barrier coating on the outer surface of the outermost coaxial conduit, said thermal barrier coating having a thermal conductivity less than that of said refractory.

4,898,369

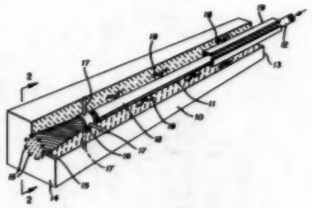
LANCE WITH METERED CORE FOR TREATING MOLTEN METAL

Joseph A. Perri, Coraopolis, Pa., assignor to Insul Company, Inc., East Palestine, Ohio

Continuation-in-part of Ser. No. 190,019, May 4, 1988, abandoned. This application Apr. 26, 1989, Ser. No. 351,889

Int. Cl.[4] C21C 5/46

U.S. Cl. 266—266 **9 Claims**



1. A lance for use in treating a bath of molten metal comprising an elongated refractory body having a central portion and first and second integral end portions all of a known width extending axially therefrom, a metal tube of a diameter less than or equal to one-fourth said known width of said elongated refractory body positioned axially in said central portion and said first end portion of said elongated refractory body so as to extend out of said first end portion and terminate inwardly of said second end portion, a plurality of smaller metal tubes arranged in a circular pattern communicating with said metal tube and positioned axially in said second end portion of said elongated refractory body and extending therefrom to the exterior end of said second end portion which defines the delivery end of said lance, means engaging said first mentioned metal tube and extending outwardly of said first end portion of said refractory body by which said lance may be supported, said plurality of smaller metal tubes being surrounded by said refractory body forming a coating thereover of a thickness

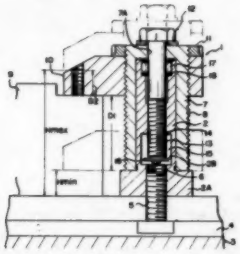
greater than the diameter of said smaller metal tubes arranged in said circular pattern, a least a portion of each of said smaller metal tubes being formed to define a narrow slot whereby a controlled volume and flow of gas at a known pressure can be discharged thereby.

4,898,370

CLAMPING APPARATUS

Masayuki Saito, and Yasuo Kazama, both of Tokyo, Japan, assignors to Nitto Kohki Co., Ltd., Tokyo, Japan

Filed Dec. 5, 1988, Ser. No. 279,765
Claims priority, application Japan, Dec. 11, 1987, 62-188683
Int. Cl.[4] B25B *1/10*
U.S. Cl. 269—91 **3 Claims**



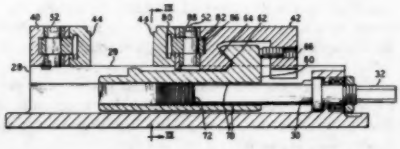
1. A clamping apparatus comprising:
a base block to be mounted on the top surface of the bed;
a cylindrical clamp base having a male screw on the outer peripheral surface thereof and mounted on the base block for up-and-down motion;
a clamp piece threadedly fitted on the male screw of t he clamp base and adapted to press an object of clamping on the bed; and
lift means for moving the clamp piece and the clamp base up and down, with respect to the base block,
said clamp base having a through hole at a top portion thereof, and said lift means including a bolt threadedly fitted in a female screw of the base block through the through hole of the clamp base, spring means arranged between the base block and clamp base for urging the clamp base upward, and stopper means fixed to the tip end of said bolt for defining the upper motion limit of said clamp base.

4,898,371

QUICK-CHANGE VISE

Perry A. Mills, 18700 Bell Dr., Nevada City, Calif. 95959, and Joel DiMarco, 4288 Revere Pl., Calver City, Calif. 90230

Filed Mar. 17, 1988, Ser. No. 169,596
Int. Cl.[4] B23Q *3/02*
U.S. Cl. 269—136 **7 Claims**



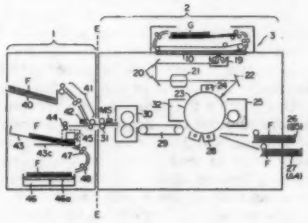
1. A vise comprising:
an elongate base member having a longitudinal axis;
a pair of jaw members with opposing faces;
means for moving said jaw members toward and away from each other along said longitudinal axis on said base member for releasably grasping a workpiece therebetween;
a jaw blank for a jaw member having a front face and a back side; and
means for releasably securing a jaw blank to a jaw member including an channel located at the back side of said blank, retaining means for slidably engaging said channel, carrier means for carrying said retaining means, means for locating said carrier means with said jaw member, and means for moving said carrier means within said jaw member to a first extreme position wherein said jaw blank on said retaining means is spaced from said jaw member and to a second extreme position wherein said jaw blank on said retaining means is clamped against said jaw member, said means for moving including an opening located in said carrier means and a cam positioned within said opening, said cam operating against a wall of said opening.

4,898,372

COPY PAPER PROCESSING APPARATUS

Tsugio Hirabayashi, and Izumi Hamanaka, both of Tokyo, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed May 23, 1988, Ser. No. 197,588
Claims priority, application Japan, May 29, 1987, 62-131604
Int. Cl.[4] B42B *2/00*
U.S. Cl. 270—53 **17 Claims**



1. A copy paper processing apparatus for processing copy papers, comprising:
a stacker tray for receiving copy papers, said stacker tray including side plates for engaging opposing sides of the copy papers when the copy papers are received on the stacker tray;
blower means for blowing air through said stacker tray to reduce static friction between said stacker tray and said copy papers;
stopper means movable between a first position for engaging one edge of the copy papers and holding the copy papers in a desired position relative to the stacker tray when the copy papers are disposed on said stacker tray and a second position for permitting the copy papers to slide freely along the stacker tray;
punching means for punching holes in the copy papers held on said stacker tray in said desired position; and
stapling means for stapling together a plurality of copy papers held on said stacker tray in said desired position.

4,898,373

HIGH SPEED SIGNATURE MANIPULATING APPARATUS

John R. Newsome, R.R. #1, Box 58A, Shumway, Ill. 62461

Continuation-in-part of Ser. No. 882,073, Jul. 3, 1986, Pat. No. 4,747,817. This application Mar. 31, 1988, Ser. No. 176,364
Int. Cl.[4] B42B *1/02*
U.S. Cl. 270—58 **18 Claims**

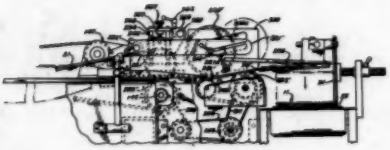
1. In apparatus for receiving a stream of documents traveling at a first velocity in spaced-apart serial relation and forming such documents into a running shingle traveling at a second

velocity which is lower than the first, the combination comprising

(a) means for imparting a lengthwise bow in each document as it is fed in to inhibit droop when the document is ejected with its leading portion unsupported,

(b) means for ejecting said documents for flyout from said means (a)

(c) means forming a moving throat with upper and lower surfaces moving, in their directly opposed regions, at said second velocity, the lower surface of said throat being closely spaced from the point of ejection, said means (c) being disposed with downstream spacing from and in relation to said means (b) such that the leading edge of an ejected document strikes said upper surface at a location upwardly displaced from the centerline of the throat, and is tucked down to ride with the setback on the preceding document which is traveling with and driven by gripping



between the directly opposed regions of said surfaces, the lower surface of said throat being the upper flight of an endless driven belt which is cross-sectionally shaped to make said lower surface upwardly convex to facilitate smooth downward drooping of the document wings laterally disposed on either side of said belt, the upper surface of said throat being the periphery of a non-driven wheel which turns idly due to contact with documents carried on said belt, said wheel being shaped to present a concave periphery so as to tend to urge said documents into a downwardly bowed configuration as a result of their leading edges striking said wheel, and

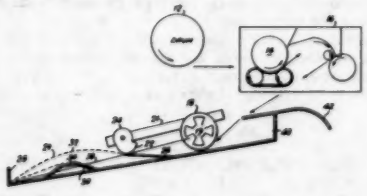
(d) a driven toothed wheel underlying said signatures at the point of ejection, the teeth of said toothed wheel catching the trailing edge of each ejected document and tucking it down to rest on the preceding document traveling with said lower surface.

4,898,374

INTERMITTENT DRIVE MECHANISM FOR COPY STACKING

David L. Vermaat, Port Crane, N.Y., assignor to Imagitek, Inc., Binghamton, N.Y.

Filed Jun. 27, 1988, Ser. No. 211,561
Int. Cl.[4] B65H 29/40
U.S. Cl. 271—178 3 Claims



1. A stacking apparatus for sheet media including an intermittent drive means comprising a drive wheel with a first circumferential portion at a proximal radius, and a second circumferential portion at a distal radius, said distal radius being greater than said proximal radius, said distal radius being chosen so as to form a nip with a guiding means thereby providing a driving period of the sheet media during rotation of said drive wheel, said proximal radius being chosen so as to not form a nip with said guiding means thereby providing a relaxation period for the sheet during rotation of said drive wheel;

a first lower recess in a path of the sheet media subsequent to said intermittent drive means to receive a trailing edge of a first sheet media of a first length thereby not obstructing the leading edge of subsequent sheet media;

nudging means in said path of the sheet media prior to said intermittent drive; and

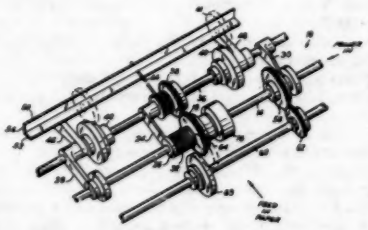
a second lower recess in said path of the sheet media prior to said nudging means to receive a trailing edge of the first sheet media of a second length, said second length being greater than said first length, thereby not obstructing the leading edge of a subsequent sheet media.

4,898,375

FEED DEVICE WITH AUTOMATIC SHEET ALIGNMENT

Bruce E. Holtje, Castle Creek, N.Y., assignor to Imagitek, Inc., Binghamton, N.Y.

Filed Feb. 2, 1988, Ser. No. 151,482
Int. Cl.[4] B65H 9/06
U.S. Cl. 271—246 12 Claims



1. An apparatus for aligning a sheet during a feeding process comprising:

a first power driven roller means;

a first idler means positioned so as to engage the sheet between said first roller means and said first idler means and feed the sheet in a given direction;

a second power driven roller means;

a second idler means;

a registration gate which is substantially perpendicular to said given direction and placed in relation to said first roller means and said first idler means so that a forward edge of the sheet may be abutted against the gate so as to block said given direction of travel of the sheet;

wherein said registration gate removing means includes a first wrap spring responsive to said second power driven roller means;

means for engaging the sheet between said second power driven roller means and said second idler means after said first power driven roller means has abutted the sheet against said registration gate;

said registration gate removing means operates substantially simultaneously with said engaging means; and

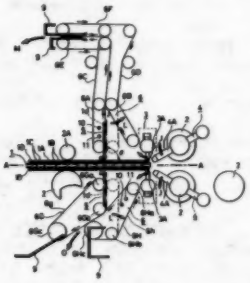
means for removing said registration gate from said direction of travel after said first roller means and said idler means have engaged the sheet for a preselected period.

4,898,376

FILM CONVEYING APPARATUS

Sigeo Sumi, Saitama, Japan, assignor to Somar Corporation, Tokyo, Japan

Division of Ser. No. 11,470, Feb. 5, 1987, abandoned. This application Aug. 11, 1988, Ser. No. 231,631
Claims priority, application Japan, Feb. 5, 1986, 61-23177
Int. Cl.[4] B65H 5/02
U.S. Cl. 271—272 8 Claims



1. In a device for removing a protective film from a board for forming a circuit thereon, the device including means for transporting the board along a path, and means for peeling the film from the board, a film conveying apparatus for conveying the peeled film away from the board and path, wherein the film conveying apparatus comprises:

a first conveyance means for conveying a film in a conveyance direction by contacting one side of the film, a plurality of said first conveyance means being disposed at predetermined intervals in a direction transverse to the conveyance direction, said first conveyance means comprising a plurality of conveyor rollers and a plurality of conveyor belts wound on corresponding ones of said conveyor rollers; and

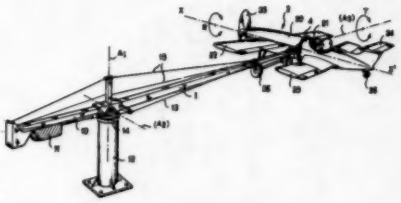
a second conveyance means for conveying the film by contacting the other side of the film, said second conveyance means comprising a plurality of conveyor rollers and a plurality of conveyor belts wound on corresponding ones of the conveyor rollers, and said conveyor rollers and corresponding ones of said conveyor belts of said second conveyance means being disposed between adjacent ones of said plurality of conveyor rollers and corresponding conveyor belts of said first conveyance means, wherein said device further comprises a plate disposed proximate to a position on the path at which the film is peeled by said means for peeling, said means for peeling including means for jetting fluid against the film to press it against one side of said plate and a third conveyance means for conveying the film which is pressed against said plate away from the plate, said third conveyance means comprising first conveyor belts extending in a direction substantially parallel to said plate and disposed on another side of said plate opposite the one side, and second conveyor belts disposed on the one side of the plate and movable between first and second positions, said second conveyor belts in said first position being disposed away from the first conveyor belts, the film and said plate, and in said second position said second conveyor belts extending in a direction substantially parallel to said plate and contacting the film, said plate being formed so as to allow said first conveyor belts to contact the film between said second conveyor belts in the second position and said plate, whereby said first and second conveyor belts are adapted for transporting the film therebetween away from said plate.

4,898,377

ROUNDABOUT WITH CLIMBING EFFECT FITTED WITH AN AIRPLANE

Jean J. Roche, 32, rue St Denis de Castinet, 53500 Ernee, France

Filed Nov. 14, 1988, Ser. No. 270,915
Claims priority, application France, Nov. 12, 1987, 87 15819
Int. Cl.[4] A63G 4/00, 1/30
U.S. Cl. 272—36 14 Claims



1. A roundabout with climbing effect, of the type comprising an airplane mounted at one end of a pole which is movable in rotation about a vertical axis so as to describe a circular motion on said axis, said pole being also movable on a horizontal axis so as to enable a variation in altitude of the airplane during its circular motion, a counterweight being provided at the other end of the pole, opposite to the airplane with regard to the vertical axis, said counterweight substantially balancing the weight of the airplane and the pilot's weight, wherein the airplane is fixed to the pole by means of a gripping device which is adapted to hold a ring which is solidly joined to the airplane and surrounds a fuselage of said airplane, said ring being contained in a plane perpendicular to a longitudinal axis of the airplane and being centered on it, the gripping device supporting the ring and the plane at the end of the pole while at the same time enabling their free rotation on said longitudinal axis, wherein the center of gravity of the unit formed by the airplane and the pilot is located substantially in the plane containing the ring and, further, wherein the airplane is a biplane having two planes located on either side of the longitudinal axis of the pole, one in front of said pole and the other behind said pole, such that, during the circular motion of the roundabout, they generate two substantially equal and opposite lifting moments, thus preventing an untimely pitch effect.

4,898,378

SAFETY HARNESS ON/OFF SWITCH ASSEMBLY FOR TREADMILLS

Marysue Edwards, Grand Blanc, and Max M. Dubrinsky, West Bloomfield, both of Mich., assignors to Safe/Stress, Inc., Grand Blanc, Mich.

Division of Ser. No. 121,924, Nov. 18, 1987, Pat. No. 4,861,021. This application Jan. 9, 1989, Ser. No. 295,075
Int. Cl.[4] A63B 23/06, 1/00
U.S. Cl. 272—69 9 Claims

1. A safety harness on/off switch assembly for a motorized treadmill comprising a support means positioned over the treadmill;

a safety harness including a pair of spaced laterally interconnected straps, at their upper ends flexibly and yieldably suspended from said support means and at their lower ends including a pair of loops to loosely receive portions of the body of a user upon the treadmill;

an electrical circuit connected to the treadmill and adapted to be connected to a power source;

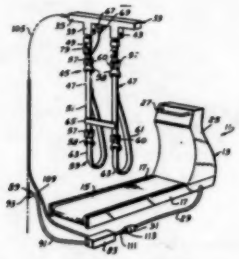
a normally closed safety switch means mounted upon said support means and interconnected in said circuit and including a movable member;

control means connected to at least one of the straps, on downward movement adapted to retract said movable

member whereby when a user falls, trips, faints or is injured the body of the user rests upon said loops extending said straps and retracting said movable member thereby opening said switch means and deactivating the treadmill;

said support means including a tubular support adapted for connection to a ceiling;

a pair of laterally spaced tubular extensions depending from said tubular support;



a transverse support bolt extending through each extension and connected thereto;

the upper ends of said straps extending into said extensions respectively; and

means nested within each extension flexibly interconnecting said straps with said support bolts;

said switch means being secured to and depending from said tubular support.

4,898,379

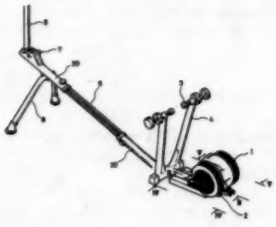
CYCLE TRAINER HAVING A LOAD APPLYING DEVICE

Kenzo Shiba, Settsu, Japan, assignor to Tsuyama Mfg. Co., Ltd., Osaka, Japan

Filed Dec. 19, 1988, Ser. No. 286,619

Int. Cl.[4] A63B *21/00, 21/24*

U.S. Cl. 272—73 **6 Claims**



1. A cycle trainer which rotatably supports a drive wheel (10) of a bicycle, constructed and arranged to be manually driven by said drive wheel through bicycle pedal movement, the cycle trainer comprising:

a rotatable roller (26),

energizing means (24, 28, 30, 31, 32, 34) for energizing said roller at a constant level of force toward a direction of said drive wheel to be in contact therewith,

movement blocking means (37, 38, 40) to be engaged with said energizing means, for blocking movement of said roller toward the direction of said drive wheel,

position adjusting means (2, 3, 4, 22, 46) for adjusting said roller to a predetermined position with respect to said drive wheel, while the movement of said roller is blocked by said movement blocking means,

disengaging means (38) for disengaging said movement blocking means from said energizing means,

said disengaging means being operable to release said movement blocking means from said energizing means, causing said roller to be rotatably in contact with said drive wheel,

said energizing means comprising:

a roller shaft (24) inserted in said roller and used integrally therewith as a unitary body,

a pair of support frames for rotatably supporting said roller shaft,

a fixing shaft (28) attached to penetrate said pair of support frames,

a fixing plate (32) to which said fixing shaft is attached,

a transverse plate (31) provided on said pair of support frames,

a coil spring placed between said fixing plate and said transverse plate, and

said pair of support frames being rotatable about said fixing shaft.

4,898,380

EXERCISING DEVICE

Hy Herman Kobrin, 6840 N.W. 10th Dr., Margate, Fla. 33063

Filed Oct. 5, 1988, Ser. No. 253,555

Int. Cl.[4] A63B *21/00*

U.S. Cl. 272—117 **14 Claims**

1. An exercise dvice comprising: a substantially planar weight of at least about three pounds having a shape generally corresponding to the shape of the letter "C", including two substantially identical turned in end portions and a central portion, between said end portions, having a reverse curvature;

each of said turned in end portions defining an unobstructed space with dimensions great enough to admit a hand and providing a hand-hold;

and said central portion defining an unobstructed space with dimensions great enough to admit a hand and providing yet another hand-hold for providing an exercise weight with a plurality of operating modes n a simple and economic structure, and in which the entire space enclosed between said turned in ends is free of other structures.

4,898,381

MULTI-EXERCISE SYSTEM

Joel D. Gordon, 3311 Woodvalley Dr., Baltimore, Md. 21208

Filed Nov. 23, 1988, Ser. No. 275,750

Int. Cl.[4] A63B *21/06*

U.S. Cl. 272—117 **19 Claims**

1. A multi-exercise system for performing weight lifting exercises with a load resistance coupled to a cable, comprising:

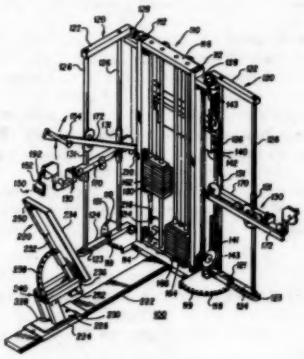
a. a vertically extended stationary main frame;

b. a plurality of weights selectively coupled to one end of

said cable for defining said load resistance disposed within said main frame;

c. at least one movable frame extension, said frame extension being pivotedly coupled to said main frame on one side thereof;

d. guide arm means vertically displaceable on said frame extension for directing an opposite end of said cable, said guide arm means includes (1) a first arm member slidingly coupled to said frame extension and extending longitudinally therefrom, and (2) first pulley means coupled to said first arm member for guiding said cable substantially parallel to said first arm member said first pulley means including at least a first and second pair of vertically opposing first pulley wheel members disposed on said first arm



member for capturing said cable therebetween, (3) a second arm member pivotedly coupled at one end to a first end of said first arm member, and (4) second pulley means fixedly coupled to said second arm member for coupling said cable to said second arm member relative to said first arm member transmits an applied force to said load resistance;

e. counter weight means coupled to said guide arm means for (1) substantially counterbalancing said guide arm means, and (2) releasably locking said guide arm means in a selected vertical positional location; and

f. actuator means coupled to said opposing end of said cable and engageable by a portion of a user's body for applying a force thereto.

4,898,382

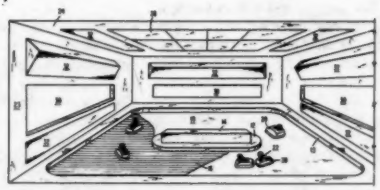
AMUSEMENT VEHICLE GAME

Egidio Lamanna, 122 Laurelcrest Avenue, Downview, Ontario M3H 2B3, Canada

Filed Jun. 16, 1989, Ser. No. 367,074

Int. Cl.[4] A63B 67/00

U.S. Cl. 273—1 GC **19 Claims**



1. Game apparatus comprising:

a self-propelled vehicle capable of carrying and being steered by an operator;

said vehicle having a forward portion and a rearward portion;

forward bumper means mounted on said forward portion and rearward bumper means mounted on said rearward portion;

said bumper means being resiliently mounted on said vehicle and adapted for bumping contact with bumper means on other vehicles;

switch means on said vehicle adapted to be actuated by said bumper means;

counter means on said vehicle adapted to be actuated by said switch means to increment in one direction upon actuation by said forward bumper means and to decrement in another direction upon actuation by said rearward bumper means; and

display means on said vehicle and associated with said counter means for displaying the count thereof.

4,898,383

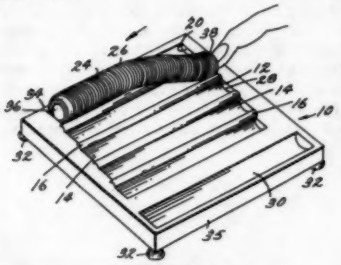
AMUSEMENT APPARATUS

Larry J. Buffington, 611 N. Summit Rd., Benton, Ark. 72015

Filed Jun. 12, 1989, Ser. No. 364,146

Int. Cl.[4] A63F 9/06

U.S. Cl. 273—1 G **8 Claims**



1. Amusement apparatus, comprising:

an undulant support surface defining a plurality of substantially parallel, alternating, rounded grooves and rounded ridges;

a first end wall defining a first end of each of said grooves and a second end wall defining a second end of each of said grooves, the distance between said first end wall and said second end wall within each of said grooves being substantially equal;

said surface defining an axis;

said first end walls located at progressively greater distances from said axis from a first one of said grooves to a last one of said grooves, and said second end walls located at progressively smaller distances from said axis from said first one of said grooves to said last one of said grooves; and

a plurality of substantially identical, round, saucer-shaped, nesting elements for positioning within said grooves and for manually manipulating among said grooves and over said ridges.

4,898,384

BATTING AID SYSTEM

G. Michael Besch, 7321 Morrison Dr., Greenbelt, Md. 20770

Filed Jun. 17, 1988, Ser. No. 208,099

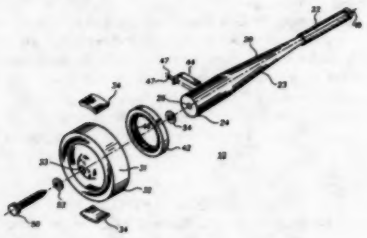
Int. Cl.[4] A63B 69/40

U.S. Cl. 273—26 R **19 Claims**

1. A batting aid system for training a baseball player to properly swing a baseball bat, comprising:

a longitudinally extended handle member defining a longitudinal axis having a gripping portion positionally located at a first end of said handle member; and,

audible feedback means pivotedly coupled to a second end of said handle member for indicating a proper baseball bat swing, said audible feedback means being responsive to rotative displacement of said handle member about said longitudinal axis during a swing of said system in simulation of a baseball bat swing, said audible feedback means having a central axis substantially coincident with said longitudinal axis and having a symmetrically located mass radially positioned about said central axis defining a



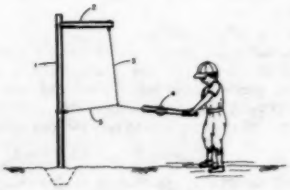
flywheel, said audible feedback means includes sound generating means coupled to both said flywheel and said second end of said handle member for providing said indication of said proper baseball bat swing, said sound generating means including driving means coupled to said second end of said handle member for initiating rotation of said flywheel responsive to rotation of said handle member about said longitudinal axis and generating an audible sound.

4,898,385

BATTING PRACTICE DEVICE

Carl D. Love, 4348 Baton Rouge Dr., Hermitage, Tenn. 37076

Filed Mar. 30, 1988, Ser. No. 173,344
Int. Cl.[4] A63B *69/40*
U.S. Cl. 273—26 E **3 Claims**



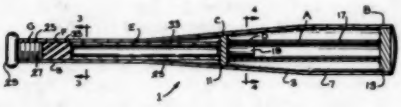
1. A batting practice device comprising:
a. a pole extending vertically from and secured to a practice surface;
b. an arm extending horizontally from the top of said pole;
c. a vertically extending tether means having its upper end attached to said arm;
d. a ball secured to the lower end of said vertical tether means;
e. a horizontal tether means with one end connected to said pole and the other end slidably connected to said vertical tether means at a point above said ball and intermediate said upper and lower end.

4,898,386

TRAINING BAT

Donald A. Anderson, 5367 Brandy La., Sylvania, Ohio 43560

Filed Feb. 10, 1989, Ser. No. 309,696
Int. Cl.[4] A63B *69/06*
U.S. Cl. 273—26 B **11 Claims**



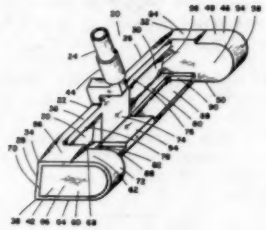
1. A training bat comprising:
a hollow cylindrical bat having a handle end and a striking end;
a disk positioned in the interior of said bat, said disk being positioned substantially in the center of said bat;
a plate positioned in the interior of said bat at substantially the end of said striking end of said bat;
an object slideably positioned in the interior of said bat, said object being moveable between said disk and said plate;
a hollow chamber positioned in said handle end of said bat, said chamber disposed for receiving a weight;
a knob removably positioned on the end of said handle end of said bat, whereby said knob closes said end of said chamber.

4,898,387

GOLF CLUBHEAD WITH A HIGH POLAR MOMENT OF INERTIA

Clifton D. Finney, 1057 Oak Hills Pkwy., Baton Rouge, La. 70810

Filed Dec. 27, 1988, Ser. No. 289,908
Int. Cl.[4] A63B *53/04*
U.S. Cl. 273—167 F **17 Claims**



1. A golf clubhead comprising:
a. a toe and heel, a front and rear, and a top and sole with an elongated ball striking surface toward said front;
b. a fastening means to affix a shaft between said heel and said toe;
c. a geometric center of said striking face, and a vertical axis through said geometric center;
d. a toe section and a heel section;
e. a body casting of a material having a predetermined lower density, said body casting comprising in said toe section a portion of said elongated ball striking surface, and at least one toe cavity; and
f. said toe section of said head from a plane perpendicular to the length line of said head through said geometric center to the extreme of said toe comprising:
i. a toe weight means comprising at least one toe weight attached to said clubhead in said toe cavity, whereby each of said toe weights is of a material having some predetermined higher density greater than said predetermined lower density of said body casting;

ii. a mass distribution means to decrease the relative mass consisting of said body casting and said toe weight means in the region of said toe section near the center of mass of said clubhead and to position a most substantial portion of the mass of said toe weight means adjacent said toe behind said ball striking surface; and

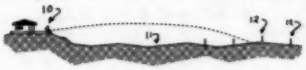
iii. a characteristic feature of said most substantial portion of said toe weight means adjacent said toe comprising a relatively thin expanded surface whereby both the width and the height of said toe weight means are generally greater than the length of said relatively thin expanded surface to resist twisting forces when a golf ball is struck.

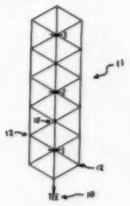
4,898,388

APPARATUS AND METHOD FOR DETERMINING PROJECTILE IMPACT LOCATIONS

Bryce P. Beard, III, 1617 Emerald St., Salisbury, N.C. 28144; James W. Klutta, 309 Arbor Rd., and Edgar P. Roberts, Jr., 761 Westover Ave., both of Winston-Salem, N.C. 27104

Filed Jun. 20, 1988, Ser. No. 208,673
Int. Cl.[4] A63B *69/36*; F41J *5/00*
U.S. Cl. 273—181 R **8 Claims**





8. An apparatus for assisting in the evaluation of targeting of an impacting golf ball and comprising:

an array of a plurality of vibration sensor means distributed in a predetermined regular geometric pattern which defines a target area which is a generally elongate, generally rectangular, generally horizontal surface area located remotely from a point from which a golf ball is dispatched toward the target area, each said sensor means for generating an electrical sensor signal indicative of the sensing of vibration,

electrical processor means electrically connected with said sensor means for receiving sensor signals generated thereby and for processing received sensor signals for determining a location of golf ball impact at any point within said target area spaced lengthwise or widthwise thereof relative to the locations of said sensor means in the target area and for generating an electrical location signal,

comparator means electrically connected with said sensor means and said processor means for receiving sensor signals generated by said sensors means and for making an ongoing comparison of signals to separate detection of a sharply rising signal from detection of a more slowly rising signal and discard the latter,

timing means electrically connected with said sensor means and said processor means for responding to a first sensor signal of impact by opening a window of time in which second and third sensor signal of impact will be sought in order that a discrimination of impact location may be performed

memory means electrically connected with said processor means for receiving and storing a plurality of location signals,

said processor means, comparator means, timing means and memory means cooperating for compiling and comparing sets of location signals indicative of the impacts of a succession of golf balls, and

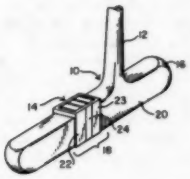
display means electrically connected with said processor means for receiving said location signal and for displaying to an observer a representation of the locations of golf ball impact in the target area.

4,898,389

IMPACT INDICATING GOLF TRAINING DEVICE

Daniel J. Plutt, 3543 Smuggler Way, Boulder, Colo. 80303

Filed Sep. 8, 1987, Ser. No. 93,994
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—186 A **12 Claims**



1. A self contained device for indicating the area of impact of the face of the head of a golf club with a ball, said face of said club having a predetermined impact center, the device comprising:

one or more impact sensitive transducer element which generates an electrical signal in response to an impact;

means responsive to an electrical signal generated by said one or more transducer elements, said responsive means linked to said one or more transducer elements, and;

means to signaling the area of impact of the face of the club with a ball, said signaling means being linked to and responsive to said means responsive to an electrical signal generated by said one or more transducer elements;

a single carrying unit, said impact sensitive transducer elements, said electrical signal responsive means, and said signaling means being carried by said single carrying unit; and

means for attachably and detachably locating said carrying unit carrying said one or more impact sensitive transducer elements, said signalling means, and said electrical signal responsive means on a golf club so that said one or more impact sensitive transducer elements, overlies the face of the club in a predetermined relationship to the impact center of the face of the club; whereby, when the face of the head of a golf club impacts with a golf ball, an electrical signal is generated by said one or more impact sensitive transducer element to cause said electric signal responsive means to signal the area of impact of the face of the club with a ball.

4,898,390

BOARD GAME

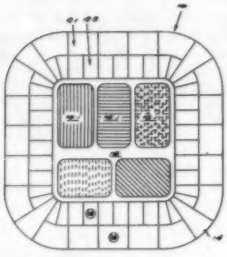
John L. De Villiers, 20 Bridgewater, 11th Avenue, Rivonia, Transvaal, South Africa

Filed Mar. 14, 1988, Ser. No. 167,970

Claims priority, application South Africa, Mar. 13, 1987, 87/1854

Int. Cl.[4] A63F 3/00

U.S. Cl. 273—249 4 Claims



1. A board game comprising in combination:

first and second different types of remarks cards, each card of said first type containing a single remark selected from a group of character attributes, each card of said second type containing a single remark selected from a group of opinion statements,

a board including a playing surface demarcated with a plurality of graduated tracks and a display area for displaying at least one card of each of said first and second sets,

a plurality of assessment indicators each assessment indicator containing:

predetermined assessments pertaining to remarks on said first and second types of cards, and

means for indicating selected assessments pertaining to remarks on displayed cards of said first and second types, and

a plurality of markers each adapted for being positioned within graduations on at least one of said tracks.

4,898,391

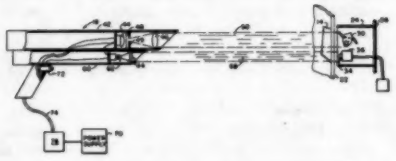
TARGET SHOOTING GAME

Bryan M. Kelly; Jorge M. Fernandez; Matthew F. Kelly, all of Pleasanton, and Mark R. Kelly, Danville, all of Calif., assignors to Lazer-Tron Company, Pleasanton, Calif.

Filed Nov. 14, 1988, Ser. No. 270,262

Int. Cl.[4] F41J 5/02

U.S. Cl. 273—310 7 Claims



1. A target shooting apparatus comprising

a plurality of rifles, each rifle comprising

means for generating a beam of light having a wavelength generally visible to the human eye,

means for frequency encoding said beam of light comprising means for pulse modulating said beam of light using a combination of at least two different frequencies,

a plurality of targets, each target comprising

means for detecting said frequency encoded beam of light,

a target first light source adapted to illuminate said target,

a target second light source adapted to indicate when a frequency encoded beam of light has been detected by said means for detecting said frequency encoded beam of light,

a central controller comprising

means for activating said plurality of target first light sources,

means for activating said means for detecting said frequency encoded beam of light,

means for deactivating said target first light source, actuating said target second light source, decoding said frequency encoded beam of light to obtain a decoded signal, deactivating said means for detecting said frequency encoded beam of light, and allocating a score to the rifle represented by the decoded signal of said frequency encoded beam of light when said means for detecting said frequency encoded beam of light detects a frequency encoded beam of light.

4,898,392

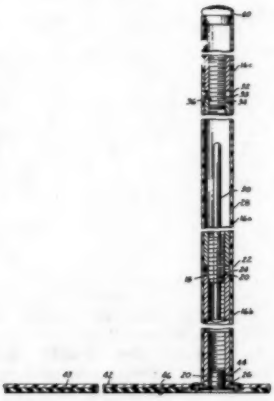
COMBINED RING TOSS AND BALL ROLL GAMES

Louis D. Goletz, 919 E. Lincoln, Royal Oak, Mich. 48067

Filed Aug. 8, 1989, Ser. No. 391,184

Int. Cl.[4] A63B 67/06, 71/00

U.S. Cl. 273—336 14 Claims



1. A ring toss game playable on a surface, comprising:

a plurality of rings;

a pair of target standards, each target standard having an elongate cylindrical shape, each target standard being comprised of at least two segments, said at least two segments comprising:

a main segment having a first end and a second end, said main segment having an axial aperture adjacent said first end thereof;

a lower segment having a first end and a second end, either of said first end and said second end of said lower segment being removably connectable with said first end of said main segment;

first connection means connected with said first and second ends of said lower segment and said first end of said main segment for removably connecting said first end and said second end of said lower segment to said first end of said main segment; and

a staking rod connected with said first end of said lower segment, said staking rod being inserted into said axial aperture of said main segment when said first end of said

lower segment is connected with said first end of said main segment;

a pair of bases, each base being structured for resting upon said surface each base selectively anchoring one target standard of said pair of target standards; and

second connection means connected with each said base for removably connecting said second end of one said lower segment to each said base;

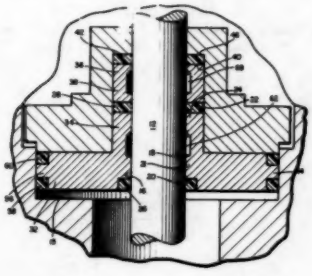
whereby said staking rod anchors its respective target standard with respect to said surface by being penetrated thereinto when said second end of said lower segment is connected with said first end of said main segment.

4,898,393

WEAR COMPENSATING STEM SEALING APPARATUS

Marvin J. Rollins, Muncie, Ind., assignor to Maxon Corporation, Muncie, Ind.

Filed Jun. 22, 1988, Ser. No. 210,372
Int. Cl.[4] F16J 15/16
U.S. Cl. 277—27 8 Claims



1. An improved wear compensating stem sealing apparatus for maintaining and prolonging the effective life of the seal to prevent migration of a pressurized fluid upon a stem, said apparatus comprising:

an elongated stem having a longitudinally dimension;

an O-ring separator which is substantially annular shaped in transverse cross-section and having an opening at the inner diameter thereof for disposition of said stem therethrough and having a first O-ring contact surface thereon, and a second O-ring confinement means at an upper portion thereof;

a first O-ring disposed snugly about said stem and having a selected radial squeeze, and in contact with said first O-ring contact surface of said O-ring separator for initially sealing pressurized fluid from migrating upwardly upon said stem;

a second O-ring disposed snugly about said stem and having a selected radial squeeze and in contact with said second O-ring confinement means of said O-ring separator to provide subsequent sealing of said stem from such pressurized fluid migrating upwardly upon said stem;

said first O-ring over time providing less efficient sealing of the pressurized fluid than said second O-ring to subject said second O-ring within said second O-ring confinement means to compressive pressure from said pressurized fluid to provide an increased radial squeeze to said second O-ring upon said stem;

a stem ring disposed about said stem, above and in contact with said second O-ring at the lower radial portion of said stem ring surface and including a third O-ring compression surface thereon; and

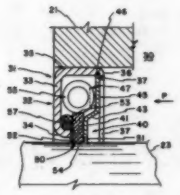
a third O-ring disposed snugly about said stem and having a selected radial squeeze, and a third O-ring compression means, whereby when said first O-ring permits migration of such pressurized fluid upwardly from said stem to exert pressure upon said second O-ring, which pressure is transmitted upwardly against said stem ring which in turn is urged upwardly to further compress said third O-ring compression means.

4,898,394

CREEP SEAL FOR ROTATING SHAFT

Robert M. Voitik, Lake Zurich, Ill., assignor to Falex Corporation, Aurora, Ill.

Filed Dec. 14, 1987, Ser. No. 132,156
Int. Cl.[4] F16J 15/00
U.S. Cl. 277—35 18 Claims



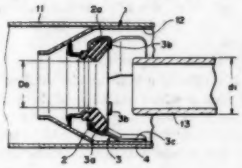
1. Seal apparatus for a rotating shaft comprising: a thin annular seal member formed of a flexible fluid-impermeable material capable of low-stress creep so that it can undergo slow movement or change in size while under relatively low stress, said seal member having an inner surface adapted for sealing engagement with the outer surface of the associated shaft, bias means coupled to said seal member for placing it under relatively low stress sufficient to induce radial creep movement thereof by resiliently urging it radially inwardly around the entire circumference thereof, said bias means having a width axially of the associated shaft substantially greater than the axial thickness of said seal member, and retaining means discrete from said seal member, said retaining means including resilient means and being disposed in resilient clamping engagement with said seal member for inhibiting movement thereof axially and circumferentially of the associated shaft while accommodating creep movement thereof radially of the associated shaft under the urging of said bias means.

4,898,395

DEVICE FOR SEALING REFUELING OPENING

Ritsuo Kawase, Shizuoka, Japan, assignor to NOK Corporation, Tokyo, Japan

Filed Nov. 8, 1988, Ser. No. 268,733
Claims priority, application Japan, Nov. 12, 1987, 62-173105[U]
Int. Cl.[4] F16J 15/00
U.S. Cl. 277—207 A 4 Claims



1. A refueling opeaing sealing device for providing a seal between a tubular casing disposed in a refueling pipe and a refueling nozzle inserted into said casing, comprising:

a seal supporting member mounted in said casing through legs; and

an elastic sealing member supported by said seal supporting

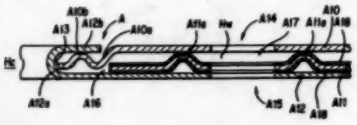
member, said elastic sealing member comprising a material containing liquid-oil-containing porous particles mixed therein so as to allow a liquid oil to exude to a surface of said elastic sealing member, said material being different than a material of said porous particles, and having a seal lip portion of a diameter smaller than an outside diameter of said refueling nozzle so as to contact an outer peripheral surface of said refueling nozzle to thereby provide a seal.

4,898,396

STEEL LAMINATE GASKET

Tsunekazu Udagawa, Ichikawa, Japan, assignor to Ishikawa Gasket Co., Ltd., Tokyo, Japan

Filed Aug. 11, 1988, Ser. No. 231,303
Int. Cl.[4] F16J *15/08*
U.S. Cl. 277—235 B **12 Claims**



1. A steel laminate gasket for an internal combustion engine having at least one cylinder hole and at least one through hole therein, comprising:

a first plate having at least one first hole corresponding to the cylinder hole of the engine, at least one second hole corresponding to the through hole of the engine, and first means for sealing around the first hole to securely seal around the same when the gasket is tightened,

a second plate situated under the first plate, said second plate having at least one third hole corresponding to the cylinder hole of the engine, and at least one fourth hole corresponding to the through hole of the engine,

at least one third plate situated between the first and second plates, said third plate including at least one fifth hole having the diameter larger than the diameter of the first means so that the first means is situate inside the fifth hole when the gasket is assembled, at least one sixth hole corresponding to the through hole of the engine, and sealing layers formed on both sides of the third plate,

second means for covering at least first means around the first hole to securely seal therearound, and

third means for sealing around the through hole of the engine, said third means being formed on at least one of the first, second and third plates to securely seal around the through hole when the gasket is tightened.

4,898,397

SEGMENTED DISK CLAMP

Robert S. Smith, 1263 Emory St., San José , Calif. 95126

Filed Mar. 29, 1988, Ser. No. 174,593
Int. Cl.[4] B23B *31/30*
U.S. Cl. 279—4 **7 Claims**

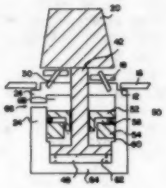
1. A clamp which comprises:

a housing comprising a wall which encloses a chamber and an entry port to admit pressurized fluid into said chamber;

a shoulder on said wall within said chamber;

a clamping piston located within said chamber;

a driving piston means within said chamber which comprises a nesting part having a nesting area and a nested part having a nested area and a space with a spring between said nested and nesting parts so that when said pressurized fluid is admitted into said chamber, said nested and nesting parts move so as to apply a first force to said clamping piston and when said nested part contacts said shoulder preventing said nested part from moving, said nesting part continues to move thereby compressing said spring and thereby applying a second force to said clamping piston which equals said first force multiplied by the ratio defined by the area of said nested and nesting areas divided by said nesting areas.

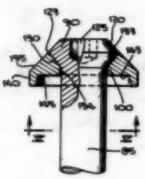


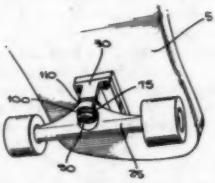
4,898,398

HIGH PERFORMANCE GRINDING KING PIN AND ASSOCIATED APPARATUS

Donald D. Cassel, 54 Rose Ave., #9, Venice, Calif. 90291

Filed Dec. 9, 1987, Ser. No. 130,685
Int. Cl.[4] A63C *17/02*
U.S. Cl. 280—87.042 **1 Claim**





1. Apparatus for attaching a skateboard truck having an opening therein to a skateboard base plate having an opening therein, the opening in the base plate including a pocket in which a threaded nut may be seated comprising:

a. an elongated member made of heat treated steel being threaded at one end thereof for insertion through the opening in the truck and the opening in the base plate and for screwable engagement with the threaded nut;

b. a head made of heat treated steel affixed to the other of said elongated member, including means embedded within it for receiving a torque-applying tool, said head protruding from the skateboard following installation such that there is no other structure which interfaces with the force of a grind on said head, and said head including a first outer surface substantially perpendicular to said elongated member, a second outer surface being connected to said first outer surface and frusto-conically shaped to bear the force of a grind over the entire length of a line tangent to said second outer surface and making an angle of between 20° and 60° with the plane perpendicular to the axis passing through said elongated member; and a tapered inner

surface connected to said second outer surface and to said elongated member; and

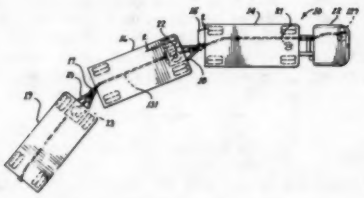
c. a washer made of heat treated steel through which said elongated member is inserted before insertion into the opening of the truck and base plate, said washer having a tapered outer surface which is frusto-conically shaped and which is substantially co-extensive with the outer surface of said head when said washer is mated with said head and a tapered inner surface connecteed to said outer surface which substantially mates with the inner surface of said head when said washer is mated with said head, said washer further having a portion which does not mate with said head when said washer is mated with said head, said portion having a portion formed therein.

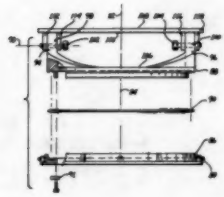
4,898,399

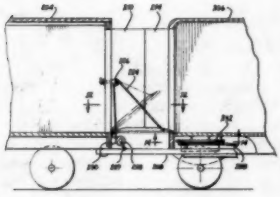
TRAILER ASSEMBLY AND METHOD

Charles R. Adams, El Paso, Tex., assignor to Aramar Inc., El Paso, Tex.

Filed Sep. 26, 1988, Ser. No. 248,626
Int. Cl.[4] B62D *53/00, 53/10*; B60J *5/12*
U.S. Cl. 280—408 **7 Claims**







1. A trailer assembly including a cab, and a plurality of trailer units pivotally interconnected in tandem using a plurality of dolly members, said assembly comprising:

thrust bearing assembly provided on each of said plurality of dolly members, said thrust bearing assembly having a bottom race member, a top race member, a top pivot plate member and a disc brake member,

said top pivot plate member being pivotally connected to said top race member and having a spring biased lock pin assembly and a grooved portion, said spring biased lock pin assembly and said grooved portion being used for mechanically communicating in an alignment relationship with a bed plate fixedly provided on each of said plurality of trailer units, said bed plate having a hole for receiving a locking pin member of said spring biased lock pin assembly and a hinge pin for being positioned within said grooved portion,

said top race member having an annular disc portion for providing a braking surface for said disc brake member and,

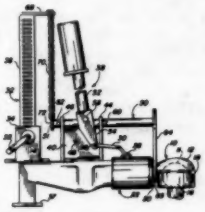
said cab having a unitary brake control means, including a metering valve for controlling actuation of said disc brake member on each of said thrust bearing assembly on each of said plurality of dolly members.

4,898,400

REMOTE OPERATED HITCH APPARATUS WITH SAFETY INTERLOCK

Johnny C. Elkins, P.O. Box 2599, San Angelo, Tex. 76900

Continuation-in-part of Ser. No. 147,196, Jan. 22, 1988, Pat. No. 4,804,204. This application Dec. 20, 1988, Ser. No. 286,707
Int. Cl.[4] B60D *1/06*
U.S. Cl. 280—427 **19 Claims**



1. A trailer hitch of the type having a main body, a ball receiving socket at one end of the main body and the other end of the main body being attachable to the end of a tongue, for example; a jack device adjacent the main body that is extensible to support the trailer near the tongue; a pivotal member, hinge means at the ball receiving socket end by which said main body and said pivotal member form hinged sections; said socket is formed jointly in said hinged sections; a collar reciprocatingly received about said main body and positioned to releasably receive the free marginal end of said pivotal member therein to thereby releasably latch the hinged sections together so that a ball can be captured therein; the improvement comprising:

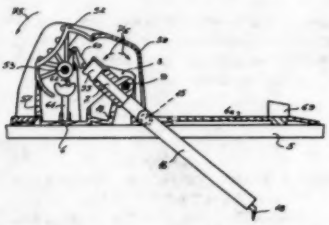
a remote actuator by which the hinged sections are forced together to enable the collar to be moved into the latched position; said actuator includes a control lever, means pivotally mounting said control lever for movement respective to the main body; actuator means connected to be moved in response to movement of said control lever, said actuator means being positioned for engaging and retracting the pivotal member into aligned position to enable said collar to be received about the marginal free end thereof; and an interlock by which said actuator means is moved against the pivotal member when the jack device is extended; whereby, the hitch can be positioned in aligned relationship respective to a ball therefor, the collar moved into a retracted position, the pivotal member engaged by said actuator means and thereby moved into a retracted position, whereupon the collar is released and captures the marginal end of the pivotal member with the hinged sections being retracted about a ball.

4,898,401

DEVICE FOR PREVENTING BACKWARD MOVEMENT FOR SKIS

Champagnac, Paul R., Unieux, France, assignor to Mecanique Generale J. DeVille Et Cie, Aurec-Sur-Loire, France

Filed May 13, 1988, Ser. No. 196,117
Claims priority, application France, May 15, 1987, 87 07099
Int. Cl.[4] A63C 7/10
U.S. Cl. 280—605 **6 Claims**



1. A device for preventing backward movement for skis, comprising:

a lug adapted to be solidly connected with the ski carrying a transverse first pin;

a flap hinged on said first pin and having bores and a transverse nose projecting from a front end thereof;

two bent and counterbent lateral arms disposed on the opposite side of said first pin from said nose and having ends forming pivot pins which are mounted in rotation in the bores of said flap so as to pivot around an axis of a longitudinal plane with respect to the ski;

lock means spaced from said flap longitudinally along the ski and forming a cradle on the ski for receiving said arms therein and locking said arms above the ski in an inactive position; and

movement means for bringing said arms from the inactive position to an active position in which said arms extend laterally and downwardly with respect to the ski,

said movement means comprising:

a second horizontal transverse pin disposed in front of said first pin;

a control rocker pivotally mounted on said second pin so as to pivot between a front position and a back position;

an elastic pusher connected to said control rocker having a notched free end which covers and applies force against said nose of said flap when said control rocker is brought into the back position and which causes said flap to pivot so as to raise said arms relative to said lock means and allow said arms to escape from the cradle formed by said locking means; and

spring means for separating said arm in the active position.

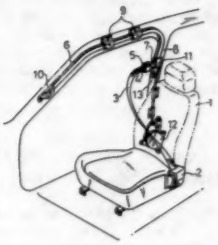
4,898,402

STRUCTURE FOR FIXING ANCHOR BASE ON STATIONARY BASE OF VEHICLE

Tomoharu Igarashi, Hiratsuka; Yoshiniro Yokote, Yokohama, and Kazuo Yamamoto, Sagamihara, all of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 26, 1988, Ser. No. 161,136
Claims priority, application Japan, Feb. 27, 1987, 62-27326
Int. Cl.[4] B60R 21/10
U.S. Cl. 280—804 **20 Claims**

1. In a structure for fixing an anchor base on a stationary base of a vehicle, said structure being suited for use in an automatic seat belt system of the type that a movable anchor travels along a guide member, the improvement wherein the anchor base has been formed from a plate-like member, has a closed transverse cross-section to surround transversely an occupant-restraining end of the guide member and extends in the direction of the length of the guide member; the anchor base is provided with a support portion to support the movable anchor on the anchor base; a side of said anchor base opposite said support portion being formed by overlapping both longitudinal edge portions of said plate-like member; an engaging portion is formed at one side of the anchor base, said one side facing the stationary base when the anchor base is fixed on the



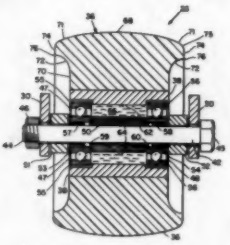
stationary base, and may hook on an engaged portion provided on a side of the stationary base to fix the anchor base on the stationary base; and the engaged portion is a projection having an expanded head portion and secured fixedly on the stationary base and the engaging portion of the anchor base is a notch for receiving the projection.

4,898,403

ROLLER SKI

Lennart B. Johnson, Federal Hill Rd., Milford, N.H. 03055

Filed Jan. 27, 1989, Ser. No. 302,818
Int. Cl.[4] A63C 17/04
U.S. Cl. 280—842 **8 Claims**



1. A roller ski comprising:

an elongated base member and

two wheels rotatably mounted at opposite ends of said base member by respective axles,

one said wheel including a stationary member that is stationary with respect to said base member and a tire member that is mounted for rotation with respect to said stationary member, said tire member including a hub and an elastomeric tire mounted on said hub, said stationary member and said tire member having a respective stationary surface and a respective rotating surface that each partially define a chamber, said wheel including a liquid in said chamber to provide viscous damping to rotation of said tire member, said liquid being sufficiently viscous to provide resistance for retarding rotation of the wheel, the resistance increasing as a function of the rotational speed of the wheel, thereby acting to reduce the terminal velocity of the roller ski, wherein said stationary member includes an elongated spindle and said hub includes said rotating surface, said spindle having an outer substantially

cylindrical surface forming said stationary surface and said hub having an inner substantially cylindrical surface forming said rotating surface, said outer cylindrical surface and said inner cylindrical surface facing each other and having a predetermined spacing therebetween.

4,898,404

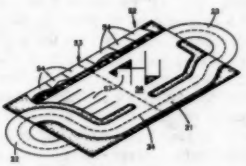
CHILDREN'S BOOK PROVIDING A CONTINUOUS ROADWAY

Richard L. Babcock, 516 Birchwood Dr., Sandusky, Ohio 44870

Filed Feb. 9, 1989, Ser. No. 308,649

Int. Cl.[4] B42D *1/00*; E01B *23/00*; A63H *18/02*

U.S. Cl. 281—15.1 **13 Claims**



1. A book comprising front and back covers, a plurality of pages between said covers, hinge means connecting said covers and pages along one edge so that said covers can be opened and said pages can be turned, said covers providing extensions projecting beyond adjacent edges of said pages, indicia on said pages depicting a plurality of roadway landscapes, turning of said pages exposing selected roadway landscapes, indicia on said extension depicting roadway sections on which toy vehicles can rest while said pages are turned.

4,898,405

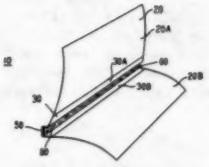
BINDABLE COVER FOLDERS

J. H. Pickering, Wayland; Sushil K. Bhatia, Framingham, both of Mass., and Roger Chevrette, Woonsocket, R.I., assignors to Dennison Manufacturing Company, Framingham, Mass.

[4]Filed Sep. 1, 1988, Ser. No. 239,455

Int. Cl.[4] B42D *3/00, 3/12*; B42C *9/00*; B32B *3/04*

U.S. Cl. 281—29 **2 Claims**



1. A folder for permanently binding a stack of paper sheets comprising,

a binder spline comprising an elongated rigid member having a channel running along its length,

said elongated member comprising a flat back panel and two oppositely facing coextensive panels emanating from said back panel, said back panel and oppositely facing panels defining said channel,

a cover sheet affixed to the elongated rigid member,

and a closed pouch containing a book binding adhesive therein, said pouch affixed to the elongated member and contained within and along the length of said channel,

means for opening the pouch along its length to expose the adhesive contained therein,

whereupon a stack of paper sheets can then be inserted into the channel so that an aligned edge of the stack of paper sheets is in direct contact with the adhesive and said stack of paper sheets thence becomes permanently bound to said binder spline.

4,898,406

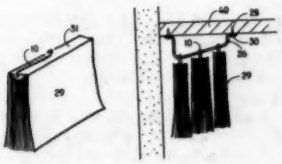
METHOD FOR HANGING BOOKS AND BOOK-LIKE ITEMS

Jeffrey D. Willint, 2322 Como Ave., St. Paul, Minn. 55108

Filed May 13, 1988, Ser. No. 193,944

Int. Cl.[4] B42D *17/00*; B42F *15/00*

U.S. Cl. 281—43 **5 Claims**



1. A method for hanging a book having a spine of a certain length comprising the steps of:

(a) providing a hanger comprising an elongate member having a substantially 180° turn therein to form a first span and a second span on either side of said turn with the end of said second span having book means formed therein, said second span having a length approximately one-half said certain length of the spine, said first span being straight and sized to slide in between the pages of the book and having a length sufficient to support the spine of the book when it is suspended using said hanger, said turn in said hanger providing that said first and second spans pinch the spine of the book to keep the hanger member engaged therewith when said hanger is inserted in the book;

(b) inserting said hanger into the book so that said first span is inside the book on one side of the spine and said second span is on the outside of the book on the other side of the spine and so that said hook means is positioned approximately half-way between the ends of the spine;

(c) providing receptacle means for receiving and coupling with said hook means;

(d) securing said receptacle means to a support member such as a wall or a shelf; and

(e) coupling said hook means of the inserted hanger to the mounted receptacle means so that the book hangs from the mounted receptacle means with the spine in a generally horizontal position.

4,898,407

COUPLING FOR PIPES WITH PLAIN ENDS

Siegmund Zeidler, Hanau, Fed. Rep. of Germany, assignor to Rasmussen GmbH, Maintal, Fed. Rep. of Germany

Filed Oct. 27, 1988, Ser. No. 263,434

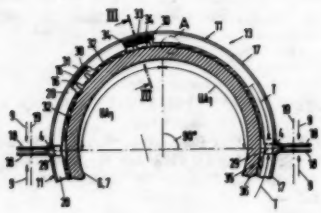
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1987, 3737669

Int. Cl.[4] F16L *25/00*

U.S. Cl. 285—328 **13 Claims**

1. A pipe coupling, particularly for pipes with plain ends,

comprising a tubular housing arranged to be placed around the ends of pipes which are to be coupled to each other, said housing having at least one substantially axially extending slot; at least two annuli of teeth carried by and provided in the interior of said housing so that each of said annuli surrounds the end of one of the pipes which are to be coupled to each other, each of said annuli including a pair of portions which flank said at least one slot and each tooth of at least one portion



of each of said annuli having a longer flank nearer to and a shorter flank more distant from said at least one slot and so constructed and arranged that when said teeth penetrate into the ends of the pipes, material build up of the pipe ends in front of the teeth is substantially eliminated; and means for varying the width of said at least one slot so as to cause said teeth to penetrate into the ends of the respective pipes in response to a reduction of the width of said at least one slot.

4,898,408

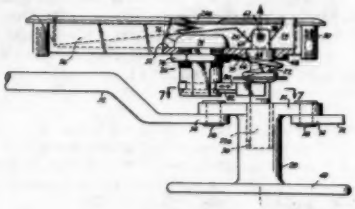
SAFE AND SECURE CAMPER SHELL DOOR LATCH

Peter Hauber, 9001 N. Glenoaks, Sun Valley, Calif. 91352

Continuation of Ser. No. 431,568, Sep. 30, 1982, abandoned. This application Aug. 30, 1988, Ser. No. 238,208

Int. Cl.[4] F05C 5/00; F05B 5/02

U.S. Cl. 292—7 **6 Claims**



1. Security latch for camper shell doors and the like, comprising a rotatable shaft adapted to extend through the door in an axial direction to be latched, an outside housing fixed to said door and defining an an axially extended outwardly open recess, an axially extendable outside handle for rotating said shaft, said handle being relatively sized with respect to said handle recess and pivotally mounted at one end to said shaft and located at one end of said recess to lie flush within said housing recess against snagging in a first condition and for extending axially from said housing recess in a second condition corresponding to the shaft operating condition of said handle, a lock assembly for selectively blocking shaft rotation, said lock assembly being partially located within said recess spaced from said handle in a manner that said handle in its said first condition overlies said lock assembly, spring means encircling said shaft for biasing said handle into its said first condition, an inside pull journaled on said shaft, and latch means carried by said pull for latching and unlatching said door upon rotation of said inside pull by said shaft.

4,898,409

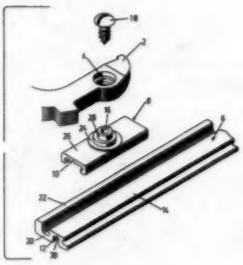
TANDEM ROD FOR CASEMENT WINDOWS

Gregory G. Carter, 68 Weber Street South, Apartment 20, Waterloo, Canada N2J 1Z7

Filed Feb. 23, 1988, Ser. No. 159,392

Int. Cl.[4] E05C 7/00

U.S. Cl. 292—31 **15 Claims**



1. A tandem rod for use between locking ends of locking handles on a casement window or the like so that all of said handles move simultaneously with the movement of any one handle, said locking ends having suitable openings therein said tandem rod comprising an elongated bar having two ends with at least two brackets, being a first bracket and a second bracket, located thereon, there being a plurality of brackets for a plurality of locking handles for said window, said brackets and said bar having corresponding male and female shapes thereon so that the brackets can slide to any desirable location along the bar but cannot be removed therefrom except at said ends, a screw each bracket having a passageway being shaped to receive said screw, and in a final assembled state said screw passes through a suitable opening in the locking end of one of said locking handles, through said passageway and being fixedly and penetratingly secured in said bar at a location thereon, thereby interconnecting said locking handle, bracket and bar and affixing said bracket at a particular location on said bar, the bracket no longer being slidable relative to said bar, the locking handle being able to pivot about said screw, one bracket and one locking handle being affixed to said bar at each location of a locking handle, the location of the locking handle determining the location of the affixed bracket, there being no pre-existing openings in said bar to receive said screw prior to the penetration of a screw for a particular bracket, potential sites for affixing the first bracket to said bar being infinite before said final assembled state, potential sites for affixing the second bracket to said bar being infinite except for the location of said first bracket.

4,898,410

LATCHING ARRANGEMENT FOR A TOP

Constantin Brin, Stuttgart, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Weissach, Fed. Rep. of Germany

Filed Sep. 15, 1988, Ser. No. 244,670

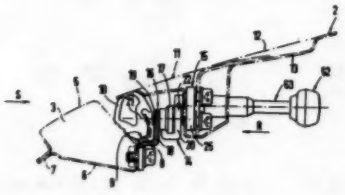
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1987, 3731068

Int. Cl.[4] B60J 7/185

U.S. Cl. 292—241 **21 Claims**

1. A latching arrangement for a top at a windshield frame means of a motor vehicle, comprising pivot lever means attached on an edge of the top, mounting means attached at the windshield frame means, the pivot lever means which is rotatably supported about an approximately horizontally aligned longitudinal axis cooperating with an actuating means, the mounting means being formed by a rotatable roller means cooperating with a guide track means provided on the pivot lever means in such a manner that during the closing operation,

the guide track means is displaced from an unlatched position extending laterally adjacent the roller means into contact with the roller means about a lower area of the roller means, at intermediate positions into a latching position located underneath the roller means, rotation axes of the pivot lever means and of the roller means being arranged on a common, approxi-



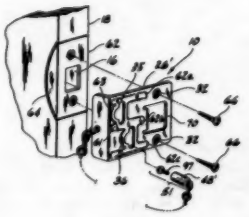
mately vertically extending plane, and during the closing operation the rotation axis of the pivot lever means travels downwardly on the vertical plane as the guide track is displaced from its unlatched to its latched position and an area of the guide track means underneath the roller means extends tangential to the roller means in the latching position and substantially at a right angle to the vertical plane.

4,898,411

PORTABLE DOOR LOCK

Dennis M. Ocello, Affton, and Harry L. Taylor, St. Louis, both of Mo., assignors to Ocello Tool & Die Co., Fenton, Mo.

Filed Jul. 26, 1988, Ser. No. 224,462
Int. Cl.[4] E05C *17/36*
U.S. Cl. 292—292 **37 Claims**



1. A door locking apparatus for use with a door frame supporting a door, the frame having a latch recess for engaging a latch on an edge of the door, said apparatus comprising:

a planar member having a portion adapted to be disposed between the door frame and the edge of the door;

means for connecting the planar member to the door frame so that the planar member is located between the door frame and the edge of the door when said planar member is connected to the door frame;

the portion of said planar member having at least one slot therein having a first edge disposed substantially parallel to the edge of the door when said planar member is connected to the door frame;

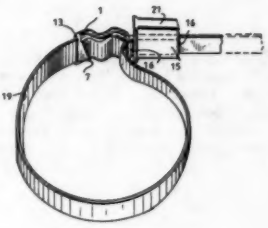
a bolt having one end with a substantially, at least partially annular groove for engaging the first edge of the slot and adapted to be received in the slot whereby, when said planar member is located between the door frame and the edge of the door and the planar member is connected to the door frame by said means and the groove of the bolt engages the first edge of the slot, said bolt precludes opening of the door.

4,898,412

TAMPER-PROOF BAG SEAL AND METHOD FOR MANUFACTURING THE SAME

Joseph H. C. Wenk, Huntington Bay, N.Y., assignor to American Casting & Manufacturing Corp., Plainview, N.Y.

Filed Jun. 1, 1988, Ser. No. 200,936
Int. Cl.[4] B05D *33/34*
U.S. Cl. 292—310 **5 Claims**



1. A bag seal for securing closure of a foldable bag comprising a tape with a secured end and a distal end and a bag engaging side and an outer side and a tape-gripping element having two tape gripping sections, a first tape-gripping section into which said secured end of the tape is fixedly connected

said first tape gripping section which comprises fold-over portions arranged to fold over said tape and be compressed thereagainst on said bag-engaging side, one of said foldover portions further comprises a projection adapted to be deflected outwardly from said fold-over portion in tape-engaging condition so that said projection is secured against a bag being secured by said seal; and a second tape-grinding section adapted to receive said distal end of said tape

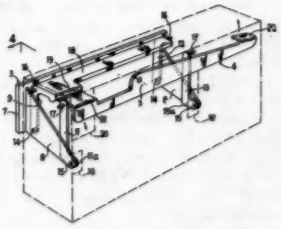
said second tape-gripping passage being initially open for entry of said distal end of said tape, said second tape-gripping passage having a plurality of opposed inwardly pointing teeth in mating relationship for engagement with the surface of each side of said tape, and being deformable for compression against said tape.

4,898,413

MANUAL CONTROL DEVICE FOR OPENING A VEHICLE DOOR

Carlo Bertolini, Les Bordes, France, assignor to Rockwell-CIM, France

Filed Jun. 14, 1988, Ser. No. 207,078
Claims priority, application France, Jun. 18, 1987, 87 08558
Int. Cl.[4] E05C *3/08*
U.S. Cl. 292—336.3 **3 Claims**



1. A manual control device for opening a vehicle door, comprising a case, a pivotable actuating lever of an associated latch, a knob capable of pivoting the actuating lever, the case being open toward the exterior and receiving the knob, two

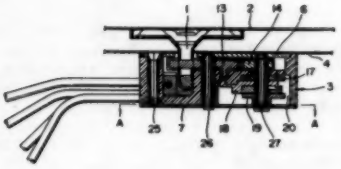
fixed pins fixed to the case and two movable pins integral with the knob associated with opposite sides of the knob, the knob being articulated on said opposite sides thereof to pivot about said two fixed pins and about said two movable pins, all of said pins being within the case, links respectively connecting, each fixed pin to a movable pin and all of said pins being so positioned that straight lines each passing through a fixed pin and a movable pin interconnected by the same link intersect outside the case.

4,898,414

WATER-TIGHT, NOISE-PROOF SEALED TYPE LOCKING APPARATUS FOR AUTOMOBILES

Shinjiro Yamada, Utsunomiya, Japan, assignor to Mitsui Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 4, 1988, Ser. No. 252,920
Claims priority, application Japan, Oct. 31, 1987, 62-276409
Int. Cl.[4] E05C *3/26*
U.S. Cl. 292—337 **2 Claims**



1. A water-tight, noise-proof sealed type locking apparatus comprising:

a synthetic resin body;

a partition wall formed medially of the synthetic resin body;

a first recess formed in the body on the front side of the partition wall to accommodate a latch and a rachet; and

a second recess formed in the body on the back side of the partition wall to accommodate rotation control members, the rotation control members including an open lever and a locking lever;

whereby the first recess is covered by a cover plate, the second recess is covered by a back plate, and a connecting member for connecting the rotation control members to a handle on a door is fitted water-tightly to the synthetic resin body.

4,898,415

APPARATUS FOR MOUNTING AN OUTER DOOR HANDLE ASSEMBLY TO AN AUTOMOTIVE DOOR

Seiki Satoh, Utsunomiya, Japan, assignor to Mitsui Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

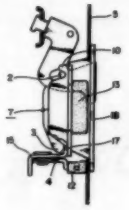
Filed Oct. 11, 1988, Ser. No. 255,582
Claims priority, application Japan, Oct. 21, 1987, 62-265939
Int. Cl.[4] E05C *21/00*
U.S. Cl. 292—347 **4 Claims**

1. An apparatus for mounting an outer door handle assembly to the automotive door, comprising:

an outer handle body consisting of an outer handle projecting therefrom, an engagement projection adapted to engage a mounting fitting, an engagement surface projecting from said body, and a flange extending at least partly about said body and being adapted to mount against the automobile door; and

a said mounting fitting which has an engagement portion for engagement with the engagement projection, an engagement claw for engagement with the engagement surface, and a projection edge;

whereby the outer handle body is inserted from outside into a mounting opening in an outer plate of the door and the mounting fitting is engaged from inside the door with the outer handle body, so that the outer plate of the door is



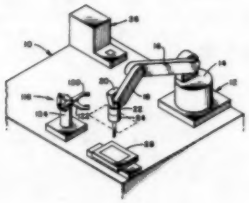
tightly clamped between the flange and the projection edge.

4,898,416

PICKUP DEVICE

Robert F. Hubbard, Buena Park, and Joseph M. Jacobs, Redondo Beach, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 5, 1988, Ser. No. 215,180
Int. Cl.[4] B25B *7/18*
U.S. Cl. 294—119.1 **17 Claims**



1. A pickup device comprising:

a frame for attachment to a movable arm so that said pickup device can be moved to a desired location, said frame having guide means thereon wherein said frame has a brake thereon for selective engagement with an adjustment ring to that said adjustment ring can be held in position when not being adjusted;

first and second carriages on said frame, said carriages being mounted on said guide means for guidance of said carriages;

adjustment means on said frame for adjusting the space between said carriages;

first and second arms respectively mounted on said first and second carriages so that by adjustment of said carriages along said guide means, the spacing between said arms can be adjusted wherein said means for adjusting said carriages along said guide means comprises said adjustment ring having first and second cam surfaces thereon, said first and second carriages being respectively engaged with said first and second cam surfaces so that rotation of said ring moves said carriages along said guide means:

first and second pairs of fingers mounted so as to pivot on said arms so that said fingers can be moved with said frame; and

means for opening and closing said fingers so that said pairs of fingers can grasp parts to be picked up, moved and positioned.

4,898,417

STRUCTURE FOR COVERING SEAT SLIDE LEGS

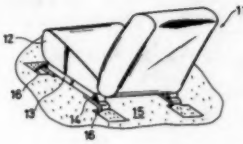
Hiroaki Kudo, Ayase, Japan, assignor to Ikeda Bussan Co., Ltd., Ayase, Japan

Filed May 26, 1988, Ser. No. 199,346

Claims priority, application Japan, May 28, 1987, 62-79863[U]; May 28, 1987, 62-79866[U]

Int. Cl.[4] B60N 3/04

U.S. Cl. 296—97.23 16 Claims



1. A structure for covering slide legs of seat slides attached to a floor panel through openings which are formed in a floor carpet placed on the floor panel, said structure comprising:

portions of said floor carpet which correspond to the slide legs attached to the floor panel, said portions being swelled upward to form pentahedron-shaped cover portions, each cover portion having a space facing toward a respective seat slide, wherein said space of each cover portion is formed when an erected side of each cover portion facing the respective seat slide is cut off, two sides of the cover portion adjacent to said space are cut along bottom edges thereof to open said two sides, and said two sides are inserted under the floor carpet after the slide legs are attached to the floor panel.

4,898,418

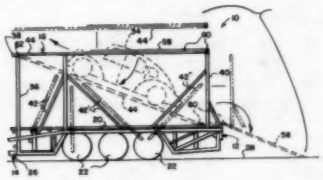
TRI LEVEL REFRIGERATED TRAILER

Robert C. Lind, Sr., 118 Riverside Dr., San Antonio, Tex. 78210, and George Spector, New York, N.Y., assignors to Robert C. Lind, Sr., San Antonio, Tex.

Filed Mar. 2, 1988, Ser. No. 163,007

Int. Cl.[4] B60P 3/00, 3/08, 3/20

U.S. Cl. 296—181 4 Claims



1. A tri-level refrigerated trailer which comprises:

(a) A first support unit for supporting a first load, said first support unit including;

(i) a first frame member for receiving the first load; and

(ii) a tri-axle wheel assembly for rollably supporting said first frame member;

(b) a second support unit extending longitudinally from said first support unit, said second support unit including:

(i) a refrigerator compartment for receiving a second load;

(ii) a second frame member for supporting said refrigerator compartment, said second frame member extending forwardly of said first frame member;

(iii) a nose with a low slung stinger fifth wheel extending forward of said second frame member having means to restrict rotation of said trailer relative to said truck for anti-skidding anti-jackknifing purposes;

(c) a third support unit extending over said first and second support units for supporting a third load, said third load support unit including:

(i) a plurality of fixed box frame posts extending upwardly from said second frame member on either side of said refrigerator compartment;

(ii) a pair of parallel ramps fixed onto the tops of said box frame posts for receiving the weight of the third load;

(iii) a plurality of removable box frame posts extending upwardly from said first frame member;

(iv) a plurality of removable support braces, each extending generally diagonally from each of said removable box frame posts to said first frame member so as to stabilize said removable box frame posts; and

(v) a pair of removable adjustable parallel ramps key-pinned on two of said removable box frame posts for supporting the third load when said third load is being moved on or off the trailer.

4,898,419

UNDERBODY STRUCTURE OF A MOTOR VEHICLE

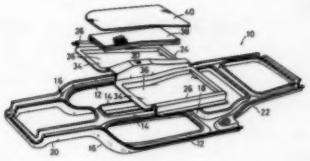
Toshihisa Kenmochi, and Tatsunori Nakamura, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 18, 1988, Ser. No. 169,902

Claims priority, application Japan, Mar. 20, 1987, 62-40073[U]; Mar. 13, 1987, 62-46669[U]; May 28, 1987, 62-79844[U]

Int. Cl.[4] B62D 21/00

U.S. Cl. 296—204 4 Claims



1. An underbody of a motor vehicle having a plurality of strength members which give strength to a body of said vehicle and individually extend in a longitudinal direction of said body of said vehicle, and a floor panel disposed between said strength members, said floor panel comprising:

a honeycomb sandwich structure having an upper plate, a lower plate, and a honeycomb core interposed between said upper plate and a recessed portion of said lower plate, wherein said recessed portion has a periphery for accommodating said upper plate, and wherein said lower plate is integrally formed with a panel for defining an upper surface of said strength members.

4,898,420

VEHICULAR OPENABLE ROOF HOOD

Yukiya Takada, Shizuoka, Japan, assignor to Suzuki Motor Company, Limited, Shizuoka, Japan

Filed Mar. 29, 1989, Ser. No. 330,127

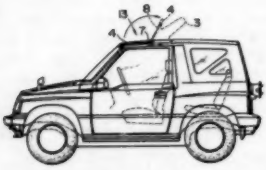
Claims priority, application Japan, May 23, 1988, 63-67690[U]

Int. Cl.[4] B60J 7/00

U.S. Cl. 296—219 1 Claim

1. A vehicular openable roof hood for covering an opening portion on the upper surface of a roof of an automotive vehicle, said hood comprising a pair of arms adapted to turn about a pair of pivotal shafts on said roof, a hood securing plate fixed to the distal ends of said arms to immovably hold the distal end of the hood, a hood cloth extending round the upper surface and the front edge of said hood securing plate to be secured to the latter from the bottom side thereof and position fixing means for immovably holding the hood at a position where it

is kept opened, wherein said hood cloth is provided with a plurality of engagement members each having a substantially U-shaped sectional configuration at the distal end thereof so as to allow it to be secured to the hood securing plate, the hood securing plate is formed with a plurality of key-shaped holes through which said engagement members are introduced so as to allow them to be held in an engaged state as well as an insert



hole through which position fixing means is inserted, each of said key-shaped holes comprising a wide part and a narrow part, and said position fixing means is secured to the ceiling portion of a vehicular body at one end thereof and includes a fixing portion for fixing a part of the position fixing means which has passed through said insert hole on the hood securing plate, the sectional shape of the position fixing means being defined in correspondence to the shape of the insert hole.

4,898,421

FOLDING FURNITURE

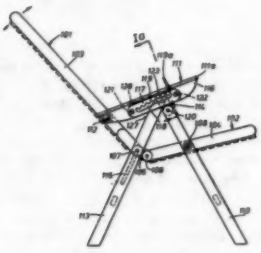
Oswald Brunn, Bunzlauer Platz 1, Munich, Fed. Rep. of Germany

Filed Feb. 20, 1987, Ser. No. 18,094

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1986, 3607619; Mar. 7, 1986, 3607581

Int. Cl.[4] A47C *4/00*

U.S. Cl. 297—28 **16 Claims**



1. An adjustment mechanism for folding furniture including a back, a seat, at least one front leg, at least one rear leg, and an arm rest, the adjustment mechanism being adapted to be positioned at the arm rest for adjusting the relative position of the back and seat and for allowing the back, seat, front and rear legs and the arm rest to be folded flat against each other to assume a compact storage position, the front and rear legs having a connection means positioned therebetween for allowing the front and rear legs to be folded together, the adjustment mechanism comprising:

a support surface forming part of the arm rest, at least one projecting part extending downwardly from the support surface to define a space beneath the support surface and adjacent the projecting part, the space being sized for receiving the front and rear legs;

a catch plate mounted on the projecting part within the space for adjusting the relative inclinations of the back, seat and arm rest;

an element for extending through one of the front and rear legs and the connection means and being adapted to be received in the catch plate for positioning the back and seat and;

repositioning means for automatically repositioning the element when the front and rear legs are folded together for allowing the back, sea, front and rear legs and the arm rest to assume its compact storage position, said repositioning means including a stopper element positioned on the rear leg.

4,898,422

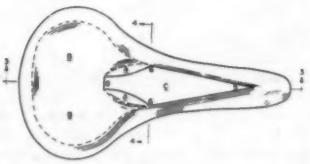
ARROWHEAD BICYCLE SADDLE

Robert V. West, III, 8480 Fredericksburg Rd., #339, San Antonio, Tex. 78229

Filed Sep. 15, 1988, Ser. No. 245,286

Int. Cl.[4] B62J *1/00*

U.S. Cl. 297—202 **1 Claim**



1. A bicycle seat having a narrow front portion which broadens from a forward edge rearwardly to a wider rear portion having a rear edge; characterized by a central cut-out having an arrow-head shape extending from a leading tip located near the forward edge of the seat to a wider mid-section, approximately halfway between the front and rear edges; said cut-out including a trailing edge portion which narrows in a rearward direction from the mid-section to a rear tip located intermediate the mid-section of the cut-out and the rear edge of the seat, and wherein the seat is relatively flat from the forward edge to the mid-section of the cut-out but which includes an elevated hump structure which borders the trailing edge and rear tip of the cut-out and which extends from the mid-section to the rear of the seat, whereas the hump structure will provide a rest for the superficial perineal space of an occupant while the cut-out provides a receptacle for the external genitalia.

4,898,423

DEVICE FOR CHANGING THE INCLINATION OF THE BACK-REST OF A VEHICLE SEAT

Erwin Kölle, Sindelfingen, and Josef Klink, Nagold, both of Fed. Rep. of Germany, assignors to Daimler Benz AG, Stuttgart, Fed. Rep. of Germany

Filed Feb. 25, 1985, Ser. No. 705,349

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1984, 3407159

Int. Cl.[4] A47C *3/02*

U.S. Cl. 297—362 **7 Claims**

1. An apparatus for changing the inclination of the back-rest of a vehicle seat, the apparatus comprising:

a first frame member,

a second frame member pivotably articulated to the first frame member, the back-rest being fixable to the first frame member,

a hand wheel mounted on the first frame member for rotation about an axis, the hand wheel being displaceable along said axis,

a driving gear coupled to the hand wheel for rotation and axial displacement therewith,

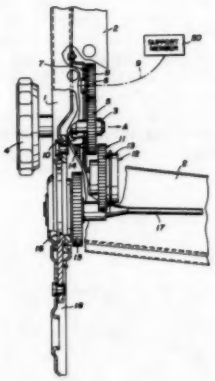
first transmission means for moving the first frame member, the first transmission means including one driven gear rotatably mounted on the second frame member, and intermediate gear stage means for interconnecting the driving gear and the one driven gear to impart rotary

motion to the driven gear in response to a rotation of the driving gear to effect pivoting of the first frame member with respect to the second frame member,

a support member drivingly engageable with the driving gear and movable in relation to the back-rest,

second transmission means for drivingly engaging the support member and moving the support member in relation to the back-rest, the second transmission means including another driven gear rotatably mounted on the first frame member,

the driving gear being selectively engageable with one of the intermediate gear stage means to move the first frame member and said another driven gear to move the support member,



first brake means operatively connected to said one driven gear for preventing rotation of said one driven gear in at least one direction when the intermediate gear stage means and the driving gear are disengaged, and

second brake means operatively connected to said another driven gear for preventing rotation of said another driven gear in at least one direction when said another driven gear and the driving gear are disengaged,

whereby the hand wheel is axially displaceable and rotatable by an operator to permit the operator to selectively activate one of the first transmission means to adjust the inclination of the back-rest and the second transmission means to adjust the position of the support member.

4,898,424

LINEAR SEAT RECLINER

Robert L. Bell, Rochester Hills, N.Y., assignor to Fisher Dynamics Corporation, St. Clair Shores, Mich.

Filed Jul. 8, 1988, Ser. No. 216,618
Int. Cl.[4] A47C *1/024*
U.S. Cl. 297—367 **38 Claims**

1. In an adjustable seat structure, a back section pivoted to a seat section and a tilt-adjusting mechanism for controlling rotation of the back to a reclining position relative to the seat, said tilt-adjusting mechanism being responsive to manual pressure applied by an operator connected thereto and characterized by:

an elongated rod having first and second end portions with said first end having a length of teeth along its top surface, said second end portion being connectable to the back at a pivot point spaced from the axis of rotation, and

a latch mechanism receiving the first end portion of said rod and connected to said seat for latching the rod, said latch mechanism supporting said rod for reciprocating movement relative to said structure and including first bias means for biasing said rod into a first direction to direct the seat back into an upright position, a latch member, including a tooth complementary to and engageable with the teeth on said rod, for latching the rod when the back is at a desired tilt, a cam plate for camming the latch member between a latched and unlatched position, said

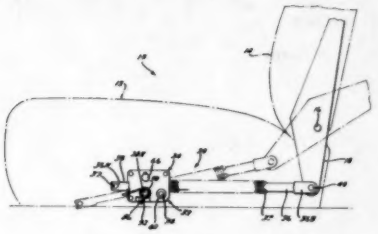


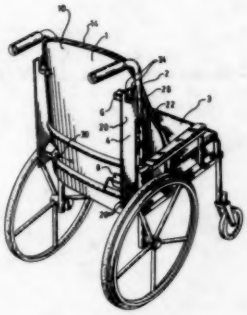
plate being rotatably mounted to the mechanism and driven in response to pressure applied by the operator, connection means for connecting the cam plate and the latch member, and second bias means for biasing the cam plate into the latched position with said rod.

4,898,425

SEAT BELT KIT FOR WHEELCHAIRS

Philip C. Mundy, 47 Van Camp Avenue, Kitchener, Ontario, Canada N2M 1J1

Filed Jun. 28, 1989, Ser. No. 372,617
Int. Cl.[4] A47C *7/00*
U.S. Cl. 297—444 **14 Claims**



1. A seat back kit attachable to the back posts of a wheelchair, comprising:

a seat back defining shell having a generally upright back portion and two integral sides leading forward therefrom, the outside dimension between said sides being less than the clear distance between the back posts of a wheelchair;

attachment means for securing said shell with respect to said back posts at upper and lower seat back attachment points with the back of said shell positionable rearward of the plane of said back posts.

4,898,426

PASSENGER SEAT FOR AN AIRPLANE

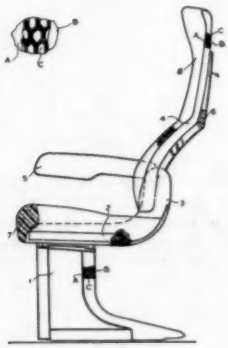
Thilo Schulz; Karl-Heinz Schmitz, and Thomas Schneider, all of Herborn, Fed. Rep. of Germany, assignors to Buderus-Seil GmbH, Herborn, Fed. Rep. of Germany

Filed Mar. 10, 1989, Ser. No. 321,991

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1988, 3811939

Int. Cl.[4] A47C *7/02*

U.S. Cl. 297—452 **6 Claims**



1. A passenger seat for an airplane, comprising:

a seat shell adapted to receive a seat cushion;

a pedestal supporting said seat shell;

a pair of supporting pieces flanking said seat shell;

respective armrests pivotally connected to said supporting pieces; and

a backrest connected to said seat shell and adapted to receive a backrest cushion, said seat shell, said pedestal, said supporting pieces, said armrests and said backrest each being constituted of at least two sandwich panels bonded together and each having a honeycomb core flanked by cover layers.

4,898,427

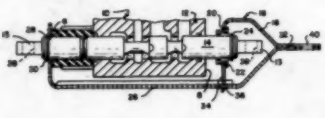
NEUTRAL STOP DEVICE

David W. Francis, Canfield, Ohio, assignor to Commercial Intertech Coporation, Youngstown, Ohio

Filed Nov. 30, 1988, Ser. No. 277,763

Int. Cl.[4] B60P *01/16*

U.S. Cl. 298—22 C **7 Claims**



1. A neutral stop device to prevent the accidental lowering of a truck bed for use on a hydraulic valve of the type having a spool whose opposite ends are both exposed outside the hydraulic valve housing during normal operation of the valve comprising:

(a) a first annular ring sized and positioned to permit a first end of the spool to pass therethrough and to prevent stop means provided on the first end from passing therethrough;

(b) a second annular ring sized and positioned to permit a second end of the spool to pass therethrough and to prevent stop means provided on the second end from passing therethrough;

(c) spacer means connected to and between the first annular ring and the second annular ring to maintain the first ring and the second ring a constant distance apart so that when the annular rings are fitted over the spool and each ring is positioned between a stop means and the valve housing the device will prevent the spool from being moved to a location which lowers the truck bed by any force acting on a pull-out cable connected to the device; and

(d) means for attaching the pull-out cable to one of the annular rings and the spacer means.

4,898,428

POWER SUPPLY SYSTEM FOR AN UNDERGROUND MINING MACHINE

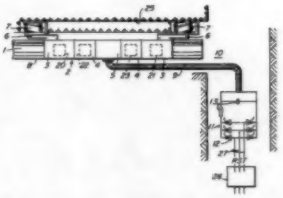
Karl-Heinz Weber, Witten-Heven, Fed. Rep. of Germany, assignor to Gebr. Eickhoff Maschinenfabrik u. Eisengieberei mbH, Fed. Rep. of Germany

Filed Aug. 5, 1988, Ser. No. 229,255

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1987, 3727800

Int. Cl.[4] E21C *29/00, 35/24*

U.S. Cl. 299—30 **9 Claims**



1. A drum-cutter loader for underground mining operations, the combination with said drum cutter-loader and a source of three phase electrical power including:

at least one cutting drum driven by a first asynchronous motor on the drum cutter-loader to release material from a mine face, and at least one winch driven by a second asynchronous motor on the drum cutter-loader for propelling the drum cutter-loader back and forth along the mine face,

rectifying means positioned remote from the drum cutter-loader coupled to receive three-phase power from a three-phase power source for converting the three-phase power to rectified direct current power;

cable means extending to the drum-cutter loader while coupled to said rectifying means for supplying said rectified direct current power; and

inverter means on the drum cutter-loader for converting the rectified direct current power supplied to said cable means to alternating current power to supply electrical power to said second asynchronous motor for driving the winch.

4,898,429

WHEEL NUT ASSEMBLY

Mark J. Plumer, 10660 Wilshire Blvd. Apt. 1106, Los Angeles, Calif. 90024

Filed Jul. 25, 1988, Ser. No. 222,668

Int. Cl.[4] B60B *3/16*

U.S. Cl. 301—9 DN **20 Claims**

1. A wheel nut assembly for mounting a non-ferrous wheel to a wheel hub and securing the wheel to a plurality of outwardly extending studs through holes in the wheel and which holes, each have a conically shaped region and a connecting cylindrically shaped region and where the wheel hub has a

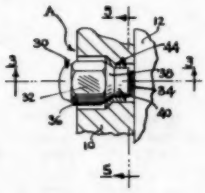
hardness substantially greater than the wheel, said assembly comprising:

(a) a lug nut having a body with a plurality of peripherally extending tool engaging walls and with a bore extending therethrough,

(b) a conically shaped section on said body, said conically shaped section having an end proximate said body and an end distal to said body and a tapered outer wall which converges towards a reduced diameter at the end distal to said body,

(c) a skirt connected to the distal end of said conically shaped section and extending outwardly from said tool engaging walls axially with said bore, said skirt and conically shaped section having a bore communicating with the bore of the body and being sized to receive a mounting stud extending from said wheel hub, and

(d) an insert formed of a ferrous material and adapted to extend around said skirt, said insert having a hardness



similar to that of said hub and substantially greater than said wheel, said insert having a central opening sized and shaped to receive said conically shaped section on said body and said skirt, said insert also having a conically shaped inner wall bearing against the conically shaped section on said body and a conically shaped outer wall bearing against the conically shaped region of said wheel, said insert further having a cylindrically shaped section integral with the conically shaped section of the insert sized to receive the skirt on the nut and extending along and bearing against a substantial portion of the axial length of the skirt on said nut, the cylindrically shaped section of said insert also bearing against the cylindrically shaped region of said wheel, so that the nut may be tightened on the stud without crushing the wheel or damaging the stud and so that the nut and sleeve in combination grip a sufficient length of stud to preclude a vibrational unwinding from the stud and reducing flexing of the stud and damaging of stud receiving holes in the wheel.

4,898,430

TRACTION SLIP AND BRAKE SLIP-CONTROLLED BRAKE SYSTEM

Horst P. Becker-Endrigkeit, Frankfurt am Main, and Joachim Maas, Griesheim, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

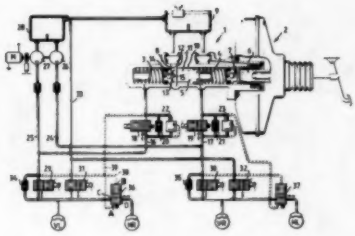
Filed Dec. 20, 1988, Ser. No. 287,310

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1987, 3744071

Int. Cl.[4] B60T *8/34, 8/40;* **F16K** *31/12, 39/00*

U.S. Cl. 303—84.2 **8 Claims**

1. A traction slip and brake slip-controlled brake system for an automotive vehicle having a driven and non-driven axle and having vehicle wheels and wheel brakes coupled to each of the axles, comprising a brake pressure generator in communication with a brake conduit, further comprising a blocking valve provided in the brake conduit section immediately behind the brake pressure generator, a pump which below the blocking valve is in communication with the brake conduit, a follower inlet-valve and a relief conduit terminating below the inlet valve into the brake conduit and switched into which is an outlet valve, further comprising branch conduits to the wheel brakes of the driven and non-driven axles, provided with a separating valve in the branch conduit to the wheel brake of the non-driven axle, further comprising wheel sensors and electronic circuits for determining the wheel rotating pattern and for generating brake pressure control signals for the inlet and outlet valves, wherein the separating valve comprises two control connections which, through first and second control



are connected to the brake pressure generator and to a pump pressure conduit respectively, and wherein the separating valve includes a switch piston means and a valve closure member, said switch piston means being operable in a traction control mode to close said valve closure member in response to a pressure differential between the respective connections of said first and second control conduits, thereby separating the wheel brake of the non-driven axle from the wheel brake of the driven axle.

4,898,431

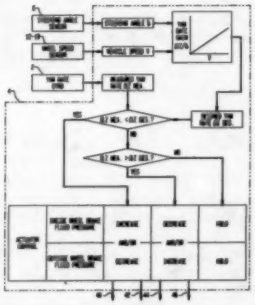
BRAKE CONTROLLING SYSTEM

Dean C. Karnopp, and Yoshiyuki Yasui, both of Davis, Calif., assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jun. 15, 1988, Ser. No. 206,735

Int. Cl.[4] B60T *8/58*

U.S. Cl. 303—100 **14 Claims**



1. An apparatus for controlling a vehicle comprising:

means responsive to the influence of destabilizing forces on a vehicle for measuring an actual yaw rate of said vehicle;

means for determining a dynamically variable target yaw rate of said vehicle and for producing an output signal in response to a comparison of said target yaw rate and said actual yaw rate; and,

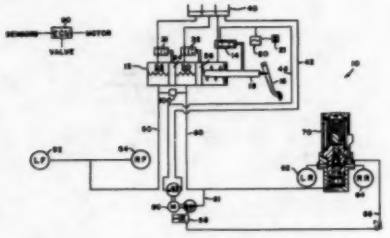
brake controlling means, responsive to said output signal, for maintaining stability of the vehicle when said vehicle is in motion.

4,898,432

ADAPTIVE BRAKING SYSTEM HAVING HYDRAULIC BOOSTER AND PUMP-BACK SYSTEM

Arthur K. Brown, Jr., South Bend, Ind., assignor to Allied-Signal, Inc., Morristown, N.J.

Filed Oct. 20, 1988, Ser. No. 260,531
Int. Cl.[4] B60T 8/44
U.S. Cl. 303—114 15 Claims



1. An adaptive braking system for a vehicle having a pair of axles with a pair of wheels and brakes on each axle, said system including a hydraulic brake booster for actuation by a vehicle operator, said hydraulic brake booster having first and second chambers in which hydraulic braking pressure is developed when a brake application is effected by the vehicle operator, a first braking circuit hydraulically communicating said first chamber with at least one brake controlling a wheel on one of said axles, a second braking circuit hydraulically communicating said second chamber with at least one brake controlling a wheel of the other axle, first electrically actuated valve means in said second braking circuit and for controlling hydraulic communication with the respective brake, control means responsive to rotation of the wheels and for controlling said one brake of the other axle by operating said electrically actuated valve means when an incipient skidding condition is detected, and pump means which supplies hydraulic pressure both to said booster for normal braking and to said one brake of the other axle when control of the one brake is effected by said control means in response to said incipient skidding conditions, hydraulic pressure being decayed away from the one brake and communicated directly to the pump means for return to the one brake during said incipient skidding condition, the direct communication to the pump means including communication with sump means that is separate from any reservoir means for said booster.

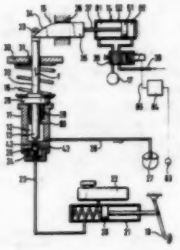
4,898,433

BRAKE PRESSURE MODULATOR FOR A BRAKE SKID-CONTROLLED BRAKE SYSTEM FOR AUTOMOTIVE VEHICLES

Hans-Christof Klein, Hattersheim, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt, Fed. Rep. of Germany

Filed Jun. 3, 1988, Ser. No. 202,079
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1987, 3718974
Int. Cl.[4] B60T 8/42
U.S. Cl. 303—115 10 Claims

1. A brake pressure modulator for a brake skid-controlled brake system for automotive vehicles, comprising at least one volume take-up means provided in a hydraulic conduit leading from a master cylinder to at least one wheel cylinder of said brake system, the volume take-up means including a plunger disposed in a cylindrical chamber, said cylindrical chamber in communication with the wheel cylinder hydraulic conduit, means for preloading the plunger into the cylindrical chamber, the plunger being closely guided out of the cylindrical chamber to the outside thereof and being connected with a vacuum-actuated driving mechanism means adapted to at leas partly retract the plunger from the cylindrical chamber upon occurrence of a brake skid signal to expand the volume of the cylindrical chamber and to thereby correspondingly decrease the brake pressure in said hydraulic conduit, variable transmission gear means provided between the driving mechanism means and the plunger, said variable transmission gear means adapted to vary its transmission ratio in response to the plunger position so that an actuating force applied by the driving mechanism



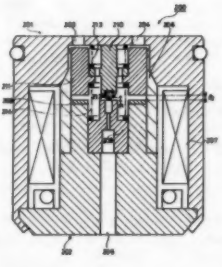
means to the plunger during an entire withdrawal operation of the plunger from said cylindrical chamber remains substantially constant, wherein the driving mechanism means is a piston/cylinder arrangement in communication with an atmospheric pressure and a vacuum source, and wherein connected to the atmospheric pressure and the vacuum source is a pneumatic blocking arrangement means for blocking movement of the plunger until a predetermined vacuum is available to apply a predetermined required pressure to the driving mechanism.

4,898,434

BRAKE PRESSURE CONTROL DEVICE FOR VEHICLES

Teruhisa Kohno; Koichi Hashida, and Koji Takata, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Division of Ser. No. 115,450, Oct. 30, 1987, abandoned. This application Oct. 25, 1988, Ser. No. 264,442
Claims priority, application Japan, Oct. 31, 1986, 61-261075
Int. Cl.[4] B60T 8/02, 8/36
U.S. Cl. 303—119 6 Claims



1. An electromagnetic control valve, comprising housing means (201, 202) for enclosing said valve, a fluid flow passage in said housing means, first port means (203, 204) and second port means (205) in said housing means for permitting fluid flow through said fluid flow passage, a fixed valve seat (208) in said fluid flow passage in said housing means, a movable valve member (210) arranged in said fluid flow passage for cooperation with said fixed valve seat (208) for closing and opening said fluid flow passage, electromagnet means (207) including an armature (211) movable in said housing means in response to

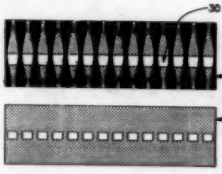
energizing and deenergizing said electromagnet means, said movable valve member being arranged inside said armature, first spring means (213) arranged for continuously urging said movable valve member in a direction toward said fixed valve seat (208), second spring means (214) arranged for continuously urging said armature (211) in a direction away from said fixed valve seat, said first spring means having a first spring force smaller than a second spring force of said second spring means, said movable valve member (210) in said armature (211), and said first and second spring means (213, 214) being so dimensioned and arranged that a displacement (l_2) of said armature is larger than a displacement (l_1) of said movable valve member so that a bidirectional fluid flow from said first port means to said second port means and vice versa is permitted when said electromagnet means are deenergized while permitting only a unidirectional fluid flow from said second port means (205) to said first port means (203, 204) when said electromagnet means are energized.

4,898,435

DARK MIRROR COATED PRISM

David L. Jaughman, Hudson, N.H.; David M. Comey, Condord; Ronald D. Stern, Newton, both of Mass., and Bruce L. Musicant, Concord, Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 24, 1988, Ser. No. 211,312
Int. Cl.[4] G02B 5/04; G01J 1/04, 5/06, 5/08
U.S. Cl. 350—1.1 3 Claims



1. In an infrared detection system including a detector array comprised of a plurality of detectors and sensitive to a radiation of interest in a predetermined wavelength band, an improved prism cold shield comprising a substrate having a top surface partially coated with a first coating layer arranged to define a plurality of bow-like stripes alternating with top surface openings which are covered by a second coating layer, and further having a bottom surface partially coated with a third coating layer in a pattern to define a line of windows on the bottom surface which are aligned with the top surface openings so as to define a field of view for the plurality of detectors, wherein the first and third coating layers are comprised of high absorption low reflectivity coatings in the wavelength band of the radiation of interest and the second coating layer is an anti-reflective coating.

4,898,436

SPATIAL LIGHT MODULATION IN COMPOUND SEMICONDUCTOR MATERIALS

Li-Jen Cheng, LaCrescenta; Gregory O. Ghecn, Pasadena, and Afshin Partovi, Los Angeles, all of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 23, 1988, Ser. No. 172,007
Int. Cl.[4] G03H 1/12; G02F 1/35; G02B 27/28
U.S. Cl. 350—3.64 10 Claims

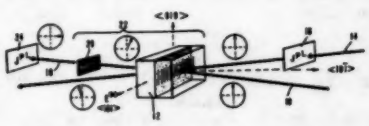
1. Apparatus for transferring information encoded on one beam of electromagnetic radiation to another beam of electromagnetic radiation comprising:

(a) a spatial light modulator comprising (1) a semi-insulating single crystal of a III-V or II-VI material, said single crystal cleaved to form a slab having a front-major surface and a rear major surface and (2) a polarizer adjacent said rear surface;

(b) means for forming a coherent input beam polarized in a given direction;

(c) means for directing said input beam onto said front major surface of said single crystal to cause diffraction of said beam, said beam passing through said polarizer to form an output beam;

(d) means for forming a coherent control beam which is



coherent with said input beam and polarized in a similar direction as said input beam;

(e) means for encoding said control beam with information; and

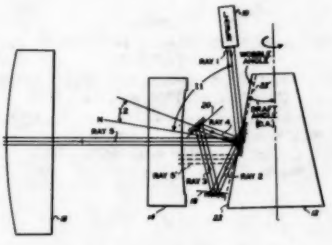
(f) means for directing said encoded control beam onto said front major surface of said single crystal to interact with said input beam within said single crystal to cause said input beam to be modulated in polarization across its wave front, whereby said information encoded on said control beam is transferred to said input beam and whereby said output beam from said polarizer is modulated in intensity.

4,898,437

WOBBLE CORRECTION BY TWO REFLECTIONS ON A FACET WITHOUT BOW

Harry P. Bruggemann, San Marino, Calif., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 532,323, Sep. 15, 1983. This application Jun. 17, 1986, Ser. No. 876,648
Int. Cl.[4] G02B 26/10
U.S. Cl. 350—6.7 22 Claims



1. A system for correcting wobble errors in a mirror scanning system with minimal first and second bow effects, said first bow effects including at least first and second aspects thereof, comprising a scanning mirror having an axis of rotation, a light source for introducing a source of light toward said scanning mirror, said light being reflected by said scanning mirror, a plurality of fixed mirrors to reflect and direct the first reflected light from said scanning mirror, said fixed mirrors being placed in the path of said reflected light from said scanning mirror, and consecutively reflecting said light from each of said plurality of fixed mirrors back to the same surface of said scanning mirror, the second reflection from said scanning mirror being a scanning light beam of a range of arc, said range of arc being a result of the rotation through a predetermined range of arc of one revolution of said scanning mirror, said scanning mirror having a zero draft angle with respect to the

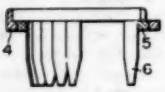
axis of rotation of said scanning mirror, the angles of incidence of said first and said second reflections from said scanning mirror being in a first predetermined selected angular relationship to each other, defining said first aspect, said plurality of fixed mirrors being in a second predetermined selected angular relationship to each other, defining said second aspect, so as to also satisfy said first predetermined selected angular relationship, and lens means for focussing said scanning light beam to a scanning point of light, the scanning beam having essentially no wobble effects as a result of the reflection back to the same surface of said scanning mirror, and no first bow effects as a result of said first and second predetermined selected angular relationships.

4,898,438

LIGHT RADIATION DEVICE FOR USE IN MEDICAL TREATMENT

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed May 12, 1989, Ser. No. 351,356
Claims priority, application Japan, Jul. 1, 1988, 63-164267
Int. Cl.[4] G02B *6/00*; A61B *17/36*
U.S. Cl. 350—96.10 **1 Claim**



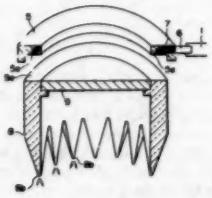
1. A light radiation device for use in medical treatment, comprising a fitted portion for engaging with a light source having a ring-shaped light-radiating end-surface, a cylindrical transparent base portion held in said fitted portion and having one end facing to the light-radiating end-surface of the light source portion and a light-radiating portion comprising of a large number of transparent tapered light-radiating elements arranged at the other end of the cylindrical transparent base portion, characterized in that said cylindrical base portion is covered with a light-reflecting layer or a clad layer at its outer and inner cylindrical surfaces.

4,898,439

LIGHT RADIATION DEVICE FOR USE IN MEDICAL TREATMENT

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Nov. 14, 1988, Ser. No. 270,894
Claims priority, application Japan, Feb. 10, 1988, 63-38338; Jul. 1, 1988, 63-164266
Int. Cl.[4] G02B *6/00*; A61B *17/36*
U.S. Cl. 350—96.10 **4 Claims**



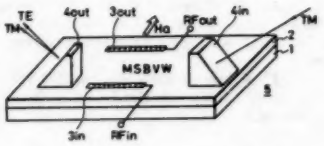
1. A light radiation device for use in medical treatment comprising a fiber optic cable, a ring-shaped light source portion and a cylindrical transparent light radiation portion, said ring-shaped light source portion including a connector for connecting said fiber optic cable thereto, an end surface, and a plurality of optical fibers each having one end connected to said connector and having another end terminating at said end surface of said ring-shaped light source portion so as to form a ring-shaped light-radiating surface thereon, said cylindrical light-radiating portion having a first end removably connected to the ring-shaped light-radiating surface of said light source portion and a second end having a plurality of tapered teeth thereon, and an enlarging lens removably secured within said cylindrical light radiation portion for observation of an object upon which light is being radiated by said cylindrical light radiation portion.

4,898,440

OPTICAL WAVEGUIDE DEVICE

Hitoshi Tamada; Masahiko Kaneko, and Tsutomu Okamoto, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 14, 1988, Ser. No. 244,164
Claims priority, application Japan, Sep. 29, 1987, 62-245020
Int. Cl.[4] G02F *1/09*
U.S. Cl. 350—96.13 **3 Claims**



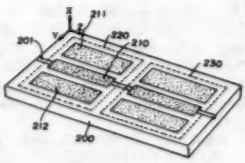
1. An optical waveguide device comprising:
(a) a layer of bismuth substituted magnetic garnet having a major surface;
(b) a pair of electrodes provided on said major surface applied with a microwave;
(c) means for applying a bias magnetic field in parallel to said major surface along a direction from one electrode to another electrode;
(d) optical input and output portions coupled to said layer to guide an optical wave therebetween, wherein said optical wave interacts with a magnetostatic backward volume wave generated by application of a microwave to said pair of electrodes with said bias magnetic field; and wherein said bismuth substituted magnetic garnet contains not less than 0.225 formula unit of Bi.

4,898,441

POLARIZATION CONTROLLER

Haruhito Shimizu, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 2, 1988, Ser. No. 188,870
Claims priority, application Japan, May 1, 1987, 62-106264; May 29, 1987, 62-137268
Int. Cl.[4] G02B *6/10*
U.S. Cl. 350—96.14 **3 Claims**



1. A polarization controller comprising,
an optical channel waveguide provided on an electrooptic substrate,
plural electrode groups provided in series in a light propa-

gating direction on said electrooptic substrate, each of said plural electrode groups including a first electrode positioned on said optical channel waveguide, and second and third electrodes positioned on both sides of said optical channel waveguide, and means for applying predetermined voltages to said first to third electrodes in said each of said plural electrode groups,

wherein said predetermined voltages are applied to said first to third electrodes so that an electric field is produced in a predetermined direction on a plane orthogonal to said light propagating direction, thereby producing a birefringence in said optical channel waveguide in accordance with an electrooptic effect of said electrooptic substrate.

4,898,442

NON-INTRUSIVE FIBRE OPTIC TAP

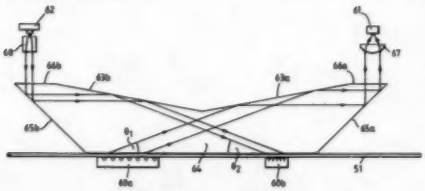
Ian F. Scanlan, and Alan Robinson, both of Harlow, Great Britain, assignors to STC PLC, London, England

Filed Feb. 8, 1989, Ser. No. 308,115

Claims priority, application United Kingdom, Feb. 11, 1988, 8803159

Int. Cl.[4] G02B 6/26; H01J 5/16

U.S. Cl. 350—96.15 **11 Claims**



1. A coupling device for coupling light into or out of an optical fibre intermediate of its two ends, which device induces microbending of the optical fibre with a spatial periodicity to effect optical coupling between the fundamental bound mode of the fibre and a cladding mode by gripping the fibre between first and second surfaces respectively of a coupling element and a co-operating member, wherein said second surface is transversely ribbed and said first surface extends rectilinearly in the axial direction of the fibre and has no transverse ribbing and wherein said optical coupling element is provided with a reflective cylindrical or conical surface positioned such that light launched into the coupling element from said bound mode via said cladding mode and making a direct reflection in said surface is substantially collimated by making that reflection.

4,898,443

COHERENT MIXING OF OPTICAL SIGNALS

Richard E. Epworth, Bishop's Stortford; Stephen Wright, London, and Terry Bricheno, Great Sampford, all of England, assignors to STC PLC, London, England

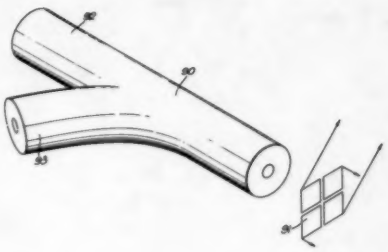
Continuation of Ser. No. 69,115, Jul. 2, 1987, abandoned. This application Dec. 19, 1988, Ser. No. 289,396

Claims priority, application United Kingdom, Aug. 5, 1986, 8619080

Int. Cl.[4] G02B 6/26, 6/42

U.S. Cl. 350—96.15 **17 Claims**

1. An optical system including a multi-element photodetector and an optical mixing element for coherently mixing first and second optical input signals for detection at a photodetector, wherein the mixing element includes means to mix said first and second input signals for incidence upon the photodetector respectively in the form providing a zero order optical field distribution and in the form of a first order field distribution, which mixing element is constituted of an optical fiber directional coupler constructed from two optical fibre means to provide said coupler with first and second input ports and a first output port, and to provide said coupler with a coupling configuration that produces a coupling coefficient for zero order modes different from that for first order modes by an amount such that zero order mode light launched into said first



input port emerges from the coupler substantially entirely from said first output port and first order mode light launched into said second input port emerges from the coupler substantially entirely from said first output port.

4,898,444

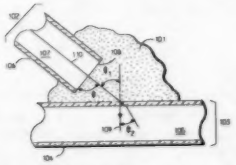
NON-INVASIVE OPTICAL COUPLER

Gary J. Grimes, Thornton; Lawrence J. Haas, Broomfield, and Jon R. Sauer, Aurora, all of Colo., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Information Systems Inc., Morristown, N.J.

Filed Nov. 30, 1988, Ser. No. 278,123

Int. Cl.[4] G02B 6/26

U.S. Cl. 350—96.15 **15 Claims**



1. An optical fiber coupler comprising:

a length of an optical fiber bus having a core and cladding and a straight region with cladding substantially similar to the cladding of the remainder of the optical fiber bus;

at least one tap optical fiber having a free end and a core-exposing face thereon, said free end of said tap optical fiber being adjacent to said optical fiber bus with the face of said free end facing said optical fiber bus region, the axes of said tap optical fiber and said optical fiber bus being positioned to permit light communication between said tap optical fiber and said optical fiber bus; and

a junction media encapsulating said tap optical fiber free end and said optical fiber bus region, said junction media having substantially the same refractive index as said cladding, thereby allowing efficient transmission of light from said tap optical fiber free end face into said optical fiber bus via said optical fiber bus cladding.

4,898,445

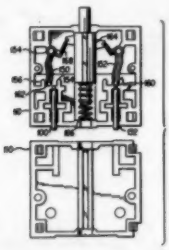
FIBER OPTIC SWITCHING SYSTEM

Edwin R. Newell; Wake Forest, and Terry E. Franks, Leicester, both of N.C., assignors to Square D Company, Palatine, Ill.

Filed Sep. 9, 1988, Ser. No. 243,055

Int. Cl.[4] G02B 6/36

U.S. Cl. 350—96.20 **3 Claims**



1. A snap-action switch for causing or preventing reflection of light at an end of each of at least two optical fibers, the switch comprising:

a housing;

a switch actuator moveably mounted within said housing;

a first support arm moveably mounted within said housing and having a first end positioned adjacent one of the optical fibers;

a first reflecting surface disposed near said first end of the first support arm;

a second support arm moveably mounted within said housing and having a first end positioned adjacent the other of the optical fibers;

a second reflecting surface disposed near said first end of said second support arm;

means connecting each of said first support arm and said second support arm to said switch actuator for permitting limited relative movement of each of said first and said second support arms between a first stable position and a second stable position, the first stable position being where said respective support arm reflecting surface reflects light at the end of its adjacent optical fiber and the second stable position being where said support arm reflecting surface reflects light at the end of its adjacent optical fiber.

4,898,446

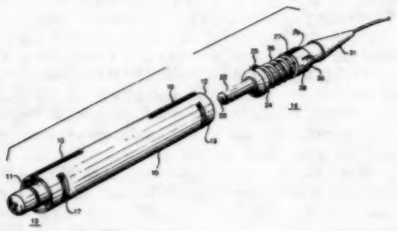
OPTICAL FIBER CONNECTOR

Roger L. Hinckley, Hackettstown, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 28, 1988, Ser. No. 263,744

Int. Cl.[4] G02B 6/38

U.S. Cl. 350—96.20 **9 Claims**



1. An optical fiber connector comprising:

a barrel member having a forward section and rearward section;

a ferrule adapted for insertion of at least one optical fiber therein, said ferrule being mounted in the forward section of the barrel member;

a sleeve adapted to receive said ferrule therein at one end, the surface of said sleeve including at least one hole at said one end; and

a collar mounted over the rearward section of the barrel and including at least one locking tab adapted to engage said hole in the sleeve so that said ferrule is secured within the sleeve.

4,898,447

OPTOELECTRONIC COUPLING SYSTEM

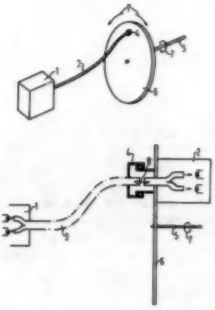
Werner Kuhlmann, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 3, 1989, Ser. No. 319,398

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1988, 3810936

Int. Cl.[4] G02B 6/42

U.S. Cl. 350—96.20 **11 Claims**



1. An optoelectronic coupling system including a light waveguide cable at each of whose ends are optically coupled to an optoelectronic conversion unit, the system characterized by the light waveguide cable being flexible yet torsionally-stable and being connected at its one end to one optoelectronic conversion unit, the light waveguide cable being separated at the other end into two axially opposing end members which are each fastened to one of two lateral portions of a pivot bearing, the pivot bearing having two lateral portions axially rotatable with respect to each other while the end members of the light waveguide cable are axially aligned and optically coupled end to end to each other, and the lateral portion of the pivot bearing associated with one end member of the light waveguide cable is rigidly connected with a carrier rotatable about an axis of rotation on which carrier the other optoelectronic conversion unit is fastened for optic coupling to one end member of the light waveguide cable.

4,898,448

FIBER DISTRIBUTION PANEL

David A. Cooper, Loganton, Pa., assignor to GTE Products Corporation, Stamford, Conn.

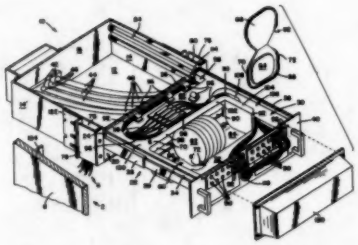
Filed May 2, 1988, Ser. No. 188,940

Int. Cl.[4] G02B 6/36, 7/26

U.S. Cl. 350—96.20 **14 Claims**

1. Apparatus for interfacing optical fibers of external fiber optical cable with select optical fibers within equipment to which such optical fibers of such external fiber optical cable are to be coupled, comprising:

a housing comprising a base, first and second opposing side walls extending vertically from said base, a rear access panel extending vertically from said base and extending from said first opposing side wall to said second opposing side wall, a forward opening opposite said rear access panel, and means associated with said first and second side walls for slideably supporting a drawer within said housing so that said drawer can be slid relative to said rear access panel into said housing and out of said housing at said forward opening, said rear access panel including at least one opening through which one or more flexible fiber tubing extends through each of which one or more optical fibers can extend from outside of said housing to the inside of said housing, one end of each flexible fiber tubing being coupled to said rear access panel at said at least one opening and an opposite end of each flexible fiber tubing extending into said housing; and,



a drawer for so sliding upon said slideably supporting means, said drawer forming an enclosure including a bottom, first and second opposing side panels extending vertically from said bottom, a rear wall extending vertically from said bottom and extending from said first opposing side panel to said second opposing side panel, and a forward mounting panel opposite said rear wall and extending vertically from said bottom and extending from said first opposing side wall to said second opposing side wall, said forward mounting panel including a plurality of optical fiber connectors, said enclosure including an optical fiber splice cradle, said bottom being spaced from said base so that said one or more flexible fiber tubing can extend into a cavity formed between said drawer and said base when said drawer is slid into said housing, said drawer including an access opening through which optical fibers of said one or more of said external fiber optical cables can extend to said splice cradle, said enclosure further including a fiber optical cable storage unit.

4,898,449

CONNECTOR FOR THE DETACHABLE CONNECTION OF LIGHT CONDUCTING FIBRES

Laurentius C. J. Vroomen; Johannes Van Esdonk; Glok D. Khoe, and Antonius H. M. Swemmers, all of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 81,197, Aug. 4, 1987, abandoned. This application Feb. 17, 1989, Ser. No. 313,321

Int. Cl.[4] G02B *6/38*

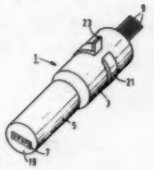
U.S. Cl. 350—96.21 **5 Claims**

1. A connector for the detachable connection of pairs of light conducting fibers comprising:

(a) first and second coupling elements, each of said coupling elements including a cylindrical reference surface and an end surface, means for mounting at least two light conducting fibers in a parallel relationship along a line, the longitudinal axis of said cylindrical reference surface being constructed and arranged to coincide with the axis of one of said light conducting fibers;

(b) an orientation element located on each of said first and second coupling elements, said orientation element being disposed in a predetermined relationship with said light conducting fibers; and

(c) a connector housing for joining said first and second coupling elements, said housing including first and second cylindrical cavities, said cylindrical cavities closely fitting said cylindrical reference surfaces and receiving said first and second coupling elements with said end surfaces of



said first and second coupling elements juxtaposed in proximate end to end relation, said connector having means for cooperative engagement with said orientation element on each of said coupling elements so as to dispose said coupling elements in the connector housing in such a manner so that the lines along which said light conducting fibers are disposed are mutually parallel.

4,898,450

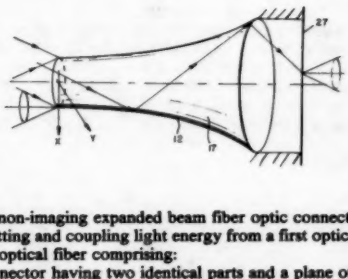
EXPANDED BEAM NON-IMAGING FIBER OPTIC CONNECTOR

Tommasz Jannson; Joanna Jannson, and Peter Yeung, all of Redondo Beach, Calif., assignors to Physical Optics Corporation, Torrance, Calif.

Filed Aug. 31, 1987, Ser. No. 91,520

Int. Cl.[4] G02B *6/38*

U.S. Cl. 350—96.21 **23 Claims**



4. A non-imaging expanded beam fiber optic connector for transmitting and coupling light energy from a first optical to a second optical fiber comprising:

a connector having two identical parts and a plane of symmetry lying equidistant between the two identical parts,

a first part for collimating and expanding a light beam propagated from a first input optical fiber to the plane of symmetry of the connector,

a second concentrating part for collecting and concentrating said light beam from said plane of symmetry to a second input optical fiber.

each of said parts having axial-rotational symmetry and containing an internally reflective side wall surface and a front refractive surface, and

in which both of said surfaces having optimized profiles, said optimized profile surfaces being designed so that the angular spectrum of light wave vectors projected onto said plane of symmetry has inverse symmetric properties when taking an angular spectrum of wave-vector projections for a given pencil of rays crossing a given plant of said plane of symmetry when making an inverse angular spectrum to said angular spectrum and calculating overlapping portions of these spectra and then calculating the remaining non-overlapping part within said angular spectrum and

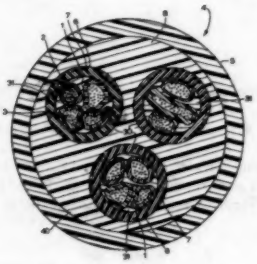
integrating said non-overlapping parts over all points of said plane of symmetry within the side wall boundary, and in which the obtained quantity is minimized by optimizing said side wall profile and said front surface profile.

4,898,451

WAX ENCASED FIBER OPTIC CABLE

Christopher A. Story, Hickory, N.C., assignor to Siecor Corporation, Hickory, N.C.

Filed Mar. 6, 1989, Ser. No. 307,470
Int. Cl.[4] G02B 6/44
U.S. Cl. 350—96.23 7 Claims



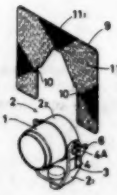
1. A fiber optic cable comprising:
(a) a plurality of free standing composites composed of an optical fiber circumscribed by a wax, each composite circumscribed by a tube-shaped member; and,
(b) a jacket, circumscribing said tube shaped members, delimiting a space in which said tube shaped members are disposed.

4,898,452

APPARATUS FOR MOUNTING TARGET PLATE ON REFLECTOR FOR ELECTRONIC DISTANCE METER

Hideya Kawachi, Yokohama, and Minoru Chiba, Isehara, both of Japan, assignors to Sokkisha Co., Ltd., Tokyo, Japan

Filed Jul. 22, 1988, Ser. No. 223,048
Claims priority, application Japan, Sep. 26, 1987, 62-239966
Int. Cl.[4] G02B 5/12; G01L 15/02
U.S. Cl. 350—97 6 Claims



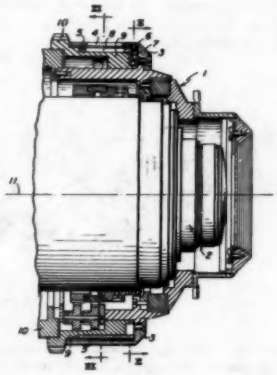
1. An for mounting a target plate on a reflector for an electronic distance meter, the reflector including a reflector body having a built-in prismatic reflection type optical member that reflects light emitted from an electronic distance meter, said apparatus comprising a support unit supporting the reflector body, the target plate being an inverted U-shape, means for engaging guide grooves extending vertically at opposing locations on both left and right sides of said support unit, the inverted U-shaped target plate being slid in and engaged with the guide grooves, and at least one locking screw provided with a knob portion and a fall-off check mechanism screwed into the support unit so that the target plate may be pressed by a forward end of the locking screw and thus locked onto the support unit.

4,898,453

MACROLENS ASSEMBLY HAVING A DISTANCE ADJUSTMENT OF MORE THAN 360 DEGREES

Harald Hohenecker, Vienna, Austria, assignor to Aari Cine & Video Gerate Gesellschaft M.b.H., Vienna, Austria

Filed Aug. 12, 1988, Ser. No. 231,483
Claims priority, application Austria, Mar. 16, 1988, 706/88
Int. Cl.[4] G02B 7/02
U.S. Cl. 350—255 15 Claims



1. A lens system using a radially adjustable distance finder comprising:
a lens mount having inner surfaces defining an inwardly protruding first projection;
first distance setting means which is rotatable to set a distance, located inside said lens mount;
second distance setting means located inside said first distance setting means, formed with an outer surface defining an outwardly projecting second projection;
means for setting a distance by rotating said second distance setting means;
projection mating means rigidly coupled to said first distance setting means, for preventing said first distance setting means from passing either said first or second projection, and
maintaining means for maintaining said projection mating means in a first location until said projection mating means contacts one of said projections, and for automatically releasing said first location in response to a force produced by said mating means.

4,898,454

OPTICAL LIGHT SWITCH OR MODULATOR DEVICE WITH A LIQUID CRYSTALLINE COMPOSITE OPTICAL COMPONENT

Alan Buckley, Berkeley Heights; Tessie M. Che, Westfield; Thomas M. Leslie, Clinton Township, / County; James B. Stamatoff, Westfield; Dagobert E. Stuetz, Watchung, all of N.J., and Donald R. Ulrich, Alexandria, Va., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Division of Ser. No. 15,757, Apr. 10, 1987, Pat. No. 4,814,211.
This application Aug. 24, 1988, Ser. No. 235,514
Int. Cl.[4] G02F 1/13; C09K 19/00, 19/52
U.S. Cl. 350—350 R 3 Claims

1. In an optical light switch or light modulator device the improvement which comprises an optical medium component which is a composite composition consisting of an inorganic

oxide glass monolith with a microporous structure containing an encapsulated liquid crystalline component; wherein the glass monolith microporous structure has an average pore diameter in the range between about 50–300 angstroms, and substantially all of the pore diameters are within about a 100 angstrom diameter variation range.

4,898,455

PYRIDINE LIQUID CRYSTALLINE COMPOUNDS

Richard Buchecker; Alfred Germann, both of Basel; Stephen Kelly, Kaiseraugst, and Martin Schadt, Seltisberg, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

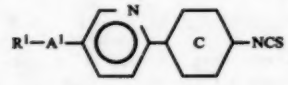
Filed Apr. 16, 1987, Ser. No. 39,143

Claims priority, application Switzerland, Apr. 22, 1986, 1638/86; Feb. 2, 1987, 356/87

Int. Cl.[4] C09K *19/34*; G02F *1/13*; C07D *213/26*

U.S. Cl. 350—350 R **9 Claims**

1. A compound of the formula:



Ia

wherein R^1 is alkyl, alkoxy, alkenyl or alkenyloxy; A^1 is a single covalent bond, trans-1,4-cyclohexylene or 1,4-phenylene; and ring C is 1,4-phenylene.

4,898,456

LIQUID CRYSTAL OPTICAL DEVICE

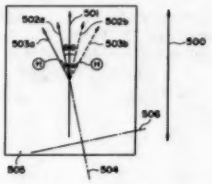
Shinjiro Okada; Osamu Taniguchi, both of Kawasaki; Akira Tsuboyama, Tokyo, and Masahiko Enari, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 854,583, Apr. 22, 1986, abandoned. This application May 5, 1989, Ser. No. 348,138

Claims priority, application Japan, Apr. 23, 1985, 60-087084; Apr. 24, 1985, 60-087828; Apr. 24, 1985, 60-087829; Apr. 24, 1985, 60-087830

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—350 S **23 Claims**



1. A liquid crystal optical apparatus comprising:

(a) as liquid crystal cell comprising a pair of electrodes and a ferroelectric smectic liquid crystal having a negative dielectric anisotropy disposed between the electrodes capable of being oriented to a first stable orientation state on one side and a second stable orientation state on the other side of the absence of an electric field, said orientation states forming an angle 2Θ between the average molecular axes of said first and second stable orientation states;

(b) means for applying between said electrodes a voltage signal sufficient to respectively transform the ferroelectric smectic liquid crystal oriented from the first or second orientation state to the second or first orientation state;

(c) means for applying between said electrodes in a non-selecting period an alternating voltage which is insufficient to transform the ferroelectric smectic liquid crystal from one to the other of the first and second orientation states but which is sufficient to provide a third stable orientation state and a fourth stable orientation state which form a large angle than said angle 2Θ; and

(d) means for detecting an optical difference between light rays having passed through the ferroelectric smectic liquid crystal oriented to said third stable orientation state and light rays having passed through the ferroelectric smectic liquid crystal oriented to said fourth stable orientation state.

4,898,457

OPTICAL SYSTEM OF TELEVISION CAMERA

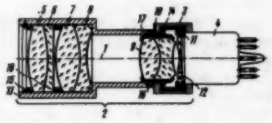
Viktor N. Alexeev, prospekt, 12, korpus 2, kv. 32, Leningrad, Tikhoretsky; Irina L. Antiropova, prospekt, 128, kv. 10, Leningrad, Nevsky, and Artemy L. Lisenko, Dimitrova, 24, korpus 2, kv. 87, Leningrad, ulitsa, all of U.S.S.R.

PCT No. PCT/SU84/00074, § 371 Date Jul. 28, 1986, § 102(e) Date Jul. 28, 1986, PCT Pub. No. WO86/03917, PCT Pub. Date Jul. 3, 1986

PCT Filed Dec. 20, 1984, Ser. No. 902,410

Int. Cl.[4] G02B *9/00, 9/34, 9/62, 13/16*

U.S. Cl. 350—463 **15 Claims**



1. An optical system of a television camera, comprising, arranged successively in the direction of the light flux on one optical axis, an objective composed of n elements and a faceplate of a television tube, a light-sensitive layer being located on a last, in the direction of the light flux, surface of said faceplate, and the last, in the direction of the light flux, element of the objective having an optical power other than zero and being used as the faceplate of the television tube, wherein the last element of the objective is a concave-flat lens having its concavity facing the object.

4,898,458

LAMINAR AIR FLOW EXTERIOR ADJUSTABLE REARVIEW MIRROR

William H. McDonald, P.O. Box 445, Londonderry, N.H. 03053-9998

Filed Jan. 1, 1989, Ser. No. 304,577

Int. Cl.[4] B60S *1/56*; B60R *1/06*; G02B *7/18*

U.S. Cl. 350—584 **7 Claims**

1. A laminar air flow exterior adjustable rearview mirror for motor vehicles, comprising:

(a) a rearview mirror housing structure constructed of rigid material circumscribing an adjustable rearview mirror situated therein, attached to the exterior portion of a motor vehicle;

(b) said structure surrounding the rearview mirror compris-

ing of an air intake aperture located on the forwardly portion of the structure, with respect to the forward motion of the vehicle exposed to the flow of air resulting from said motion of the vehicle, communicating with a vertically oriented curvilinear shaped air compression chamber integral to the mirror housing structure, and situated and integral to a semi-spherical moisture sump depression formed within the bottom of said chamber, and a moisture weep duct integrated and connecting the moisture sump depression with an oblong formed moisture weep orifice opening situated on the lowest elevation of the rearview mirror housing structure through which moisture present in said depression may pass, and a rearview mirror situated within the cavity of the mirror housing structure, attached to an adjustable movement mechanism providing infinite angular movements to said mirror, and an oblong formed air exhaust aperture situated adjacent to the rearwardly side of the rearview mirror housing structure, positioned vertically over the rearview mirror, and communicating with the verically oriented curvilinear shaped air compression chamber in combination,

(c) a means depleting moisture from the flow of air entering into the invention, through the air intake aperture, as the vehicle with invention attached thereto travel in a forward direction and,

(d) a means creating increased atmospheric air pressure within the portion of the invention, subject to encountered inflow of air through the air intake aperture, as the vehicle with invention attached thereto travel in a forward direction and,

(e) a means increasing the velocity and momentum of the exhaust air flow, which permeates the air exhaust aperture, relative to intake air flow, as the vehicle with invention attached thereto travel in a forward direction and,

(f) a means directing the exhaust air flow, which permeates the air exhaust aperture, vertically over the viewing surface of an exterior infinitely adjustable rearview mirror situated within the rearview mirror housing structure, as the vehicle with invention attached thereto travel in a forward direction and,

(g) a means creating an air flow momentum, in proportion with the vehicle speed, onto the viewing surface of the adjustable rearview mirror, and any vapor or particulate matter thereon, as the vehicle with invention attached thereto travel in a forward direction.

4,898,459

READING SPECTACLES

Carl E. Eriksson, Djursholm, Sweden, assignor to Iris Optics Ltd., London, England

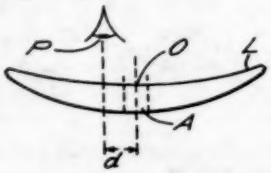
PCT No. PCT/GB86/00735, § 371 Date Oct. 1, 1987, § 102(e) Date Oct. 1, 1987, PCT Pub. No. WO87/03382, PCT Pub. Date Jun. 4, 1987

PCT Filed Dec. 2, 1986, Ser. No. 113,819

Claims priority, application United Kingdom, Dec. 2, 1985, 8529595

Int. Cl.[4] G02C *7/16*

U.S. Cl. 351—46 **7 Claims**



1. A method of preparing a pair of reading spectacles for testing by a user, wherein a mask is applied to each lens of the spectacles, the mask having therein a window whose centre corresponds substantially to the optical centre of the lens, the size of the window being determined in accordance with an inverse relationship to the strength of the lens.

4,898,460

SPECTACLES HAVING A FRAME FORMED BY AN ELONGATED CYLINDRICAL ELEMENT COMPRISING DEFORMABLE BELLOWS

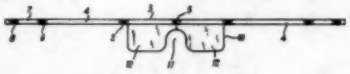
Michel Magninat, and Eric Charden, both of Paris, France, assignors to Bronton Limited, France

Filed Jun. 29, 1988, Ser. No. 213,017

Claims priority, application France, Jul. 1, 1987, 87 09293

Int. Cl.[4] G02C *5/14, 5/22*

U.S. Cl. 351—114 **8 Claims**



1. Spectacles comprising a frame, a set of lenses separate from and connected to the frame,

said frame made from an elongated continuous cylindrical element which forms the front frame part to which the set of lenses are connected as well as the side branches which are to be positioned to the sides of the wearer's head, said continuous cylindrical element being capable of being initially rectilinear and bent, at least at certain locations, into a desired shape by the wearer, said certain locations being located at least at the junctions of said side branches with the front part and said certain locations comprising a semi-rigid deformable bellows, such that the frame can be bent at said bellows, by the wearer, into a shape which, because of the semi-rigid deformable characteristic, retains its bent shape while being capable of being subsequently deformed.

4,898,461

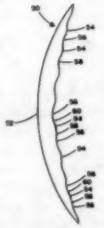
MULTIFOCAL OPHTHALMIC LENS

Valdemar Portney, 7 Alasslo, Irvine, Calif. 92720

Continuation of Ser. No. 56,050, Jun. 1, 1987, abandoned. This application Jun. 14, 1989, Ser. No. 366,319

Int. Cl.[4] G02C *7/04, 7/06*

U.S. Cl. 351—169 **44 Claims**



19. A multifocal ophthalmic lens for providing variable vision correction power, said lens having first and second zones with the second zone lying radially outwardly of the first zone, each of said zones having a first region with near vision correction power, a second region with far vision correction power and an intermediate vision region between the first and second regions, the intermediate vision region including progressive intermediate vision correction powers which are intermediate the near vision correction power and the far

vision correction power and which provide vision correction for intermediate distances.

4,898,462

DEVICE FOR DETECTING A TRANSMISSIVITY OF A SUBSTANCE

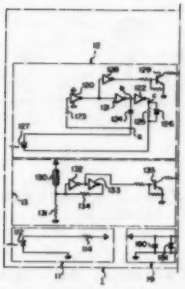
Koji Numata; Fumio Asakura, both of Toyohashi; Yoshiyuki Kago, Nishio; Masaei Nozawa, Okazaki; Takahiro Shibakawa, Kariya; Hajime Akado, Anjyo, and Hideharu Kato, Nukata, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Nippon Soken, Inc., Nishio, both of, Japan

Filed Feb. 25, 1988, Ser. No. 160,302

Claims priority, application Japan, Feb. 26, 1987, 62-43967; Mar. 5, 1987, 62-51153

Int. Cl.[4] G01N *33/28, 21/59*

U.S. Cl. 356—70 **13 Claims**



1. A device formed in a housing portion for detecting a transmissivity of a substance, comprising:

light emitting means including a light emitting element; and

photodetecting means including a photodetecting element, said photodetecting means being spaced from said light emitting means by a predetermined distance, said photodetecting means for detecting a transmitted light value of a substance passing through a space between said light emitting means and said photodetecting means as an amount of light transmitted through said substance, said photodetecting means comprising a photooscillator circuit including said photodetecting element as one component element thereof for outputting a signal having characteristics selected from a cycle and a frequency corresponding to said transmitted light value, said photodetecting means being incorporated with said photodetecting element as a unit which is fixedly provided inside a housing portion of said device.

4,898,463

OPTICAL TIME DOMAIN REFLECTOMETER WITH AUTOMATIC MEASURING FUNCTION OF OPTICAL FIBER DEFECTS

Takashi Sakamoto, and Kazumaro Kitagawa, both of Atsugi, Japan, assignors to Anritsu Corporation, Tokyo, Japan

Filed Nov. 23, 1988, Ser. No. 276,231

Claims priority, application Japan, Nov. 27, 1987, 62-297803

Int. Cl.[4] G01N *21/88*

U.S. Cl. 356—73.1 **15 Claims**

1. An optical time domain reflectometer comprising:

light emitting means for supplying an optical pulse to a target optical fiber;

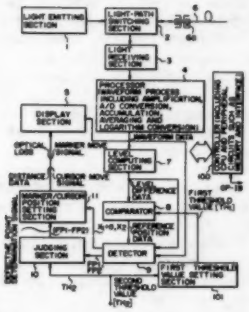
light receiving means for producing an electric signal corresponding to reflection light from said target optical fiber;

processing means for performing digital processing on said electric signal from said light receiving means, to thereby produce waveform data;

level computing means for computing level difference data for a predetermined unit interval of said waveform data from said processing means;

comparing means for comparing said level difference data computed by said level computing means with a first threshold value and producing reference position data indicating a position where said level difference data exceeds said first threshold value;

detecting means for retrieving from said comparing means that level difference data from said level computing means which is located within a predetermined range preceding and succeeding said reference position data, to thereby



detect first and second position data indicating preceding and succeeding constant-value start points, and detect first level data included in said waveform data from said processing means, which corresponds to a point attained by adding said predetermined unit interval to said first position data, and second level data of said waveform data which corresponds to said second position data; and

judging means for acquiring difference data indicating a difference in level between said first and second level data detected by said detecting means and determining a defective point in said target optical fiber by comparing said difference data with a second threshold value.

4,898,464

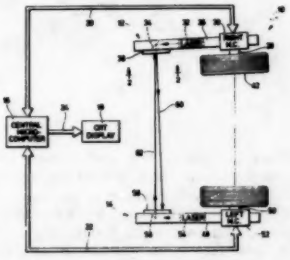
METHOD AND APPARATUS FOR DETERMINING THE POSITION OF AN OBJECT

Glenn A. Thorne; Robert D. Joy, and Jeff A. Simpson, all of Cedar Rapids, Iowa, assignors to Bee Line Company, Bettendorf, Iowa

Filed Aug. 31, 1987, Ser. No. 91,601

Int. Cl.[4] G01B *11/26*; G01C *21/06*

U.S. Cl. 356—152 **15 Claims**



1. An apparatus for determining the position of an object, comprising:

a source of an electromagnetic radiation beam;

an array of spaced, electromagnetic radiation beam detectors for said beam, each detector including detector signal producing means associated therewith for producing a variable magnitude detector signal in response to the intensity of electromagnetic radiation impinging thereon, said detector signal being subject to a signal bias due to the effects of ambient light, detector bias, or the like;

means mounting one of said source and array in a fixed relationship relative to said object;

structure for locating the other of said source and array in a fixedly spaced relationship relative to said object and in an orientation for impingement of said beam on said array;

altering means for selectively altering the intensity of said source-derived electromagnetic radiation impinging on said array between relatively lower and higher intensities whereby each of said detector signal-producing means associated with said detectors produces respective corresponding first and second detector signals;

digital converting means coupled with said detector signal producing means for receiving said first and second signals and for converting said signals into respective, corresponding, first and second digital signals; and

digital signal processing means coupled with said converting means and including digital memory means for receiving said first and second digital signals and for storing respective first and second data sets representative thereof in said memory means,

said processing means including means for retrieving and comparing said data sets to one another for producing an output data set representative of the difference therebetween and thereby representative of respective detector signals without said signal bias and for producing an output signal indicative of the location of said beam relative to said array wherein said location is indicative of the position of said object relative to one of said source and array.

4,898,465

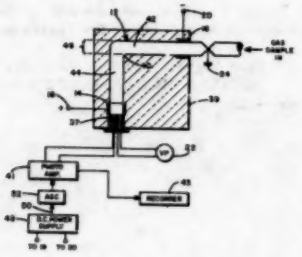
GAS ANALYZER APPARATUS

A. Gerrit Crawford, White Bear Lake, and Douglas C. Morrison, Shoreview, both of Minn., assignors to Medical Graphics Corporation, St. Paul, Minn.

Filed Jan. 30, 1989, Ser. No. 302,919

Int. Cl.[4] G01N 21/66

U.S. Cl. 356—311 **7 Claims**



1. In a gas analyzer of the type incorporating a tubular glow-discharge path having a cathode electrode at a first end of said path and an anode electrode at the other end, with means for introducing an unknown gas mixture into the interior of said tubular path while maintaining a predetermined negative pressure therein, and photodetector means positioned to intercept light emanating from said tubular path for producing a signal indicative of the concentration of a particular gas constituent of said mixture, the improvement comprising: a bend formed in said tubular path such that said anode electrode and said cathode electrode are non-colinear, said photodetector means being disposed in coaxial alignment with said tubular path proximate said anode electrode.

4,898,466

METHOD AND APPARATUS FOR EMISSION SPECTROSCOPIC ANALYSIS

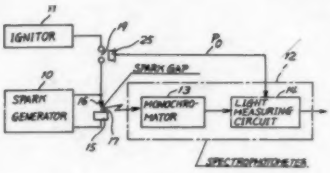
Isao Fukui, Uji; Shuzo Hayashi, Kyoto, and Takao Miyama, Muko, all of Japan, assignors to Shimadzu Corporation, Japan

Filed Nov. 21, 1988, Ser. No. 274,332

Claims priority, application Japan, Nov. 30, 1987, 62-303988; Apr. 26, 1988, 63-103167

Int. Cl.[4] G01N 21/63, 21/67

U.S. Cl. 356—313 **19 Claims**



1. A method of emission spectroscopic analysis of a sample containing elements to be analyzed, comprising:

providing energy in the form of a cyclic pulses each having a waveform which comprises a relatively high energy portion and a relatively low energy portion continuing from said relatively high energy portion, said relatively high energy portion providing a sufficient amount of energy to vaporize said elements contained in said sample and said relatively low energy portion providing a sufficient amount of energy to cause said vaporized elements to emit light;

concentrating the energy of each of said pulses on said sample; and

spectroscopically measuring said light emitted by said vaporized elements.

5. The method of claim 1, wherein said relatively high energy portion of each of said pulses include a first relatively high peak while said relatively low energy portion includes a second peak which is lower and less steep than said first peak.

4,898,467

SPECTROMETER APPARATUS FOR SELF-CALIBRATING COLOR IMAGING APPARATUS

James R. Milch, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 7, 1988, Ser. No. 267,596

Int. Cl.[4] G01J 3/28; H04N 1/46

U.S. Cl. 356—328 **11 Claims**

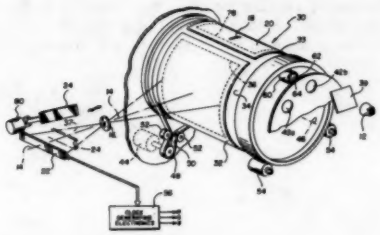
1. Spectrometer apparatus for measuring the spectral characteristics of color imaging apparatus of the type including a solid state image sensor having multiple pixels, and optical apparatus for projecting light, transmitted via a color image, along an optical axis for illuminating pixels of said image sensor, said spectrometer apparatus comprising:

(a) a light source;

(b) a member, defining an optical slit, positionable on the optical axis between said light source and the optical apparatus in a plane occupied by a color image when it is illuminated; and

(c) a diffraction grating positionable on the optical axis between the optical apparatus and the image sensor to disperse light, projected by the optical apparatus, onto the image sensor, the magnitude and the location of the light impinging upon the image sensor varying as a function of

optical characteristics of the color imaging apparatus including the spectral content of said light source and the



spectral transmissivity characteristics of the optical apparatus and the image sensor.

4,898,468

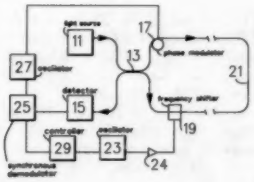
SAGNAC DISTRIBUTED SENSOR

Eric Udd, Huntington Beach, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Jun. 20, 1988, Ser. No. 208,982

Int. Cl.[4] G01B 9/02

U.S. Cl. 356—345 **52 Claims**



1. A distributed optic sensor, comprising:

light source means for producing a first beam of light;

beam splitting means, optically connected to said light source means, for receiving said first beam of light from said light source means, splitting said beam of light into a second and a third beam of light, and recombining said second and said third beams into a fourth beam of light;

optical path means in optical connection with said beam splitting means for directing said second and third beams in counterpropagating directions.

phase modulating means, optically connected to said optical path means, for impressing a demodulation frequency change on one of said second and third beams of light as it enters said optical path means, and for impressing a demodulation frequency change on the other of said second and third beams of light as it leaves said optical path means;

frequency shifting switch means, optically connected to said optical path means, for switching and controlling the frequency difference between said second and third counterpropagating light beams; and,

detection means, optically connected to said optical path means, for detecting momentary and steady state phase shifts of said second and said third beams of light from said fourth light beam including electrical circuitry means for measuring the environmental disturbances along said optical path means.

4,898,469

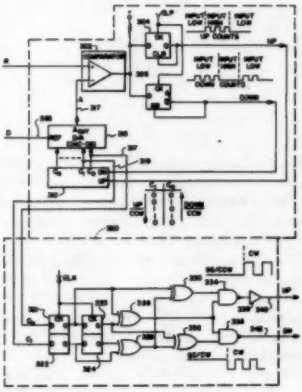
DITHER SIGNAL REMOVER FOR A DITHERED RING LASER ANGULAR RATE SENSOR

Wesley C. Sewell, 2171 Paddock Cir., Dunedin, Fla. 33528, and Stephen P. Callaghan, 3532 Skycroft Dr., St. Anthony, Minn. 55418

Division of Ser. No. 737,978, May 24, 1985. This application Oct. 4, 1988, Ser. No. 254,002

Int. Cl.[4] G01C 19/64

U.S. Cl. 356—350 **1 Claim**



1. A digital dither reference signal for a dithered ring laser angular rate sensor comprising:

a clock signal generator for providing clock pulses;

means responsive to dithering of said sensor for providing an analog output signal indicative thereof;

means for comparing said analog output signal and a first analog reference signal, said comparator providing an output signal having at least first and second values indicative of the sign of said comparison;

first gate means for providing a pulse on a first signal line for each clock pulse during those times that said comparator output is at said first state;

second gate means for providing a pulse on a second signal line for each clock pulse during those times that said comparator output is at said second state;

counter means for counting in one direction for each pulse on said first signal line, and counting in the opposite direction for each pulse on said second signal line, said counter having a binary output representative of said count;

analog to digital converter for converting the digital representation of the count of said counter to said first analog reference signal; and

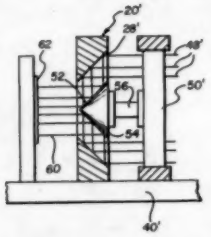
means responsive to the state of at least the two least significant bits of said binary count output for generating a pulse on either of third and fourth signal lines for each clock pulse, said third signal line having a pulse when the binary value of said least two significant bits advances, and on said fourth signal line when the binary value of said two least significant bits decreases, such that the difference between the number of pulses on said third and fourth signal lines is representative of said dithering.

4,896,470

APPARATUS AND METHOD FOR TESTING CIRCULAR CYLINDRICAL OR CONICAL SURFACES

Edwin E. Cleaveland, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 12, 1988, Ser. No. 218,756
Int. Cl.[4] G01B 11/00
U.S. Cl. 356—359 **8 Claims**



1. Apparatus for use with a Fizeau interferometer for testing the trueness of a circular cylindrical or conical specularly reflective surface of a piece to be tested, said surface having an axis, the interferometer being adapted to project a beam of collimated light, said apparatus including:

a member having a conical specularly reflective surface having an axis;

tested piece mounting means for mounting the piece to be tested with the axis of the surface of the piece to be tested coincidental with the axis of the conical specularly reflective surface of said member;

means for mounting said member and said piece to be tested with the axis of said conical specularly reflective surface of said member parallel to the beam of collimated light projected by the Fizeau interferometer, whereby the projected light is incident on said conical specularly reflective surface of said member;

said conical specularly reflective surface of said member having a cone angle such that light reflected by said conical specularly reflective surface of said member is incident on the surface of the piece to be tested and is directly or indirectly reflected thereby onto the conical specularly reflective surface of said member and is reflected by said surface of said member axially of the conical specularly reflective surface of said member towards the interferometer, whereby the light projected by the Fizeau interferometer and the light reflected by the conical specularly reflective surface of said member towards the interferometer interfere and the interference pattern created may be inspected with the Fizeau interferometer.

4,896,471

PARTICLE DETECTION ON PATTERNED WAFERS AND THE LIKE

John L. Vaught; Armand P. Neukermans, both of Palo Alto; Herman F. Kelderman, Berkeley, and Franklin R. Koenig, Palo Alto, all of Calif., assignors to Tencor Instruments, Mountain View, Calif.

Continuation of Ser. No. 64,319, Jun. 18, 1987, abandoned. This application Sep. 19, 1988, Ser. No. 248,309
Int. Cl.[4] G01B 11/00
U.S. Cl. 356—394 **21 Claims**

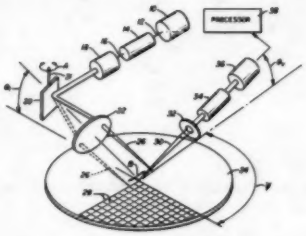
1. A method of particle detection on a patterned surface comprising,

(a) scanning a substantially flat surface with a single laser beam, said beam scanning said surface in a sequence of paths,

(b) collecting approximately constant solid angles of acceptance of light scattered from a plurality of points on said surface with an optical collection system,

(c) detecting said collected light and producing an electrical signal corresponding to the intensity of light collected,

(d) producing electrical waveform templates from said electrical signal, said surface having a periodic pattern representing a plurality of die formed thereon, each of said waveform templates representing a portion of a scan path corresponding to one of said die, one of said waveform templates corresponding to a die being designated as a reference waveform template,



(e) comparing the waveform template corresponding to another die with said reference waveform template, differences between the waveform templates representing particles on the surface in said scan path, and

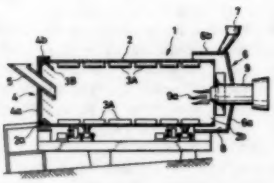
(f) repeating steps (a)–(e) until at least a predetermined number of said die have been scanned.

4,896,472

PLANT OF BATCH SYSTEM FOR PRODUCING A COMPOSITE PAVING MATERIAL BY USING A BITUMINOUS WASTE PAVEMENT MATERIAL

Hideo Sasaki, Ageo, Japan, assignor to Taisei Road Construction Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 40,886, Apr. 21, 1987, abandoned. This application Dec. 5, 1988, Ser. No. 281,952
Claims priority, application Japan, Apr. 25, 1986, 61-96168
Int. Cl.[4] B28C 5/20, 5/46, 7/04
U.S. Cl. 366—18 **1 Claim**



1. A batch system plant for producing a composite paving material by using a bituminous waste pavement material, comprising:

a heating means which includes a rotary cylindrical body in a lengthwise configuration, inclined in a vertical direction, having a top and bottom and mounted, on its inner top and bottom surfaces, with agitating blades, said heating means having an elevated opening section over which there is loosely fitted an elevated wall member equipped with a new aggregate material introduction chute, and a lowered opening section over which there is loosely fitted a lowered wall member equipped with a bituminous waste material introduction chute separate from said rotary cylindrical body and also equipped, at its central part, with a burner which heats the new aggregate material;

a new-aggregate material supply passageway which is connected to said new aggregate material introduction chute

and which supplies said new aggregate material from a new aggregate feeder to said new aggregate material introduction chute through a first arrangement of conveyors, said arrangement of conveyors including, among them, a new aggregate material conveyor scale equipped with an amount-of-new-aggregate-material indicating device;

a reproduction material supply passageway which is connected to said bituminous waste material introduction chute and which supplies a bituminous waste pavement material from a bituminous waste material feeder having an inverter which adjusts the flow rate of said waste material, to said bituminous waste material introduction chute through a second arrangement of conveyors, said second arrangement of conveyors including, at a terminal end of its arrangement, a bituminous waste material conveyor scale equipped with an amount-of-reproduction-material indicating device, said new aggregate material and said bituminous waste material being mixed together and then heated to form said composite paving material; and

a ratio control section which is connected between said inverter and said amount-of-new-aggregate-material indicating device having an automatic interlocking operation which can be changed to a manual independent operation and vice versa, and which makes a comparison between respective indicated supplying values of said new aggregate material and waste reproduction material and thereby proportionally controlling the value of the waste material relative to the value of the new material so that both said values may bear a predetermined ratio, to generate a command control signal to said inverter for controlling the supply and ratio of said heated new-aggregate and unheated bituminous waste material.

4,898,473

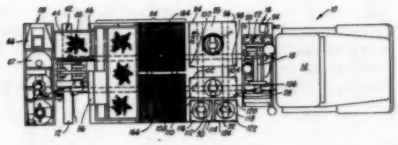
BLENDED SYSTEM WITH CONCENTRATOR

Calvin L. Stegemoeller, and Lonnie R. Walker, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Division of Ser. No. 199,560, May 27, 1988. This application May 2, 1989, Ser. No. 345,933

Int. Cl.[4] B01F *15/02*

U.S. Cl. 366—132 **11 Claims**



1. A blender system, comprising:

a blender tub means for blending a solid particulate material in a liquid, said tub means having a tub outlet defined therein,

a pump means having a pump suction inlet and a pump discharge;

suction conduit means for conducting a tub outlet stream from said tub-outlet and an initially separate liquid supply stream from a liquid supply to said pump suction inlet; and

a solids concentrator means for separating a pump discharge stream from said pump discharge into a lower density recirculating stream and a higher density concentrator discharge stream, said concentrator means having a concentrator inlet means for receiving said pump discharge stream, a low density outlet means for directing said recirculating stream back to said tub, and a high density outlet means for discharging said concentrator discharge stream.

4,898,474

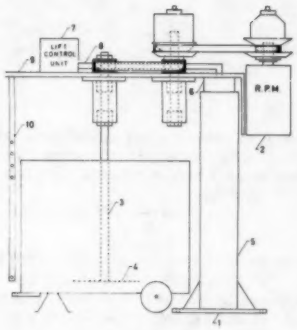
SELF-CONTAINED, ADJUSTABLE DISPERSER AND MIXER

Benjamin Lipson, Apt B 403, Cedarbrook Hill Apts., Wyncote, Pa. 19095

Filed Oct. 21, 1987, Ser. No. 110,840

Int. Cl.[4] B01F *7/18, 15/00*

U.S. Cl. 366—286 **2 Claims**



1. A mixing device for agitating and mixing a liquid, said device comprising,

(a) a motor connecting a shaft and an impeller to do the mixing,

(b) a support structure to which the motor is attached,

(c) a cylinder attached to a base and containing a slidably and rotatably movable piston attached to said support structure,

(d) a control unit with actuating means to operate said piston in said cylinder by means of a control fluid to raise and lower said support structure,

wherein said control unit is mounted on said support structure and said control unit actuating means is connected to said support structure to be in easy reach of an operator, such that the operator may operate said actuating means while simultaneously keeping in view said liquid being mixed, and wherein said piston is a solid body containing a passageway for transfer of control fluid through said piston from an entrance at the top of said piston to an exit at the bottom of said piston, to allow said fluid to move between said piston and said cylinder through said passageway.

4,898,475

APPARATUS AND METHOD FOR THE MEASURING OF DEW POINTS

Petr Horn, Samstagern, Switzerland, assignor to Novasina AG, Pfaffikon, Switzerland

Filed Mar. 14, 1988, Ser. No. 167,975

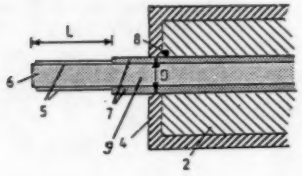
Claims priority, application Switzerland, Mar. 16, 1987, 1058/87

Int. Cl.[4] G01N *25/68*

U.S. Cl. 374—28 **6 Claims**

1. An apparatus for the measuring of dew points, including a first sensor intended to measure a temperature, a chiller block intended for the chilling of a bedewable surface having an area and at least one connecting piece arranged as heat transfer means between said chiller block and said bedewable surface, in which said connecting piece comprises a two ended member made of thermoconductive material, said member being at one end in thermal contact with said chiller block and at the other end in thermal contact with said bedewable surface, and comprising a cross-sectional area for heat transfer between the two ends of said connecting piece, said cross-sectional area being at

least three times less than the total area of the bedewable surface, and in which said first sensor is provided at or adjacent to said bedewable surface, whereas a second sensor intended



for measuring the temperature of the chiller block is provided at said chiller block, whereby the temperature gradient along said member between said bedewable surface and said chiller block can be controlled.

4,898,476

ARRANGEMENT FOR MEASURING THE WATER VAPOR DEW POINT IN GASES

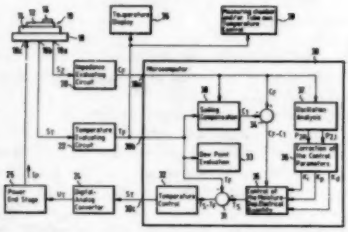
Rainer Herrmann, Steinen, and Dieter Funken, Lörrach, both of Fed. Rep. of Germany, assignors to Endress u. Hauser GmbH u. Co., Fed. Rep. of Germany

Filed Aug. 25, 1988, Ser. No. 236,667

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1987, 3740719

Int. Cl.[4] G01N *25/68*

U.S. Cl. 374—28 **16 Claims**



1. Method for measuring the water vapour dew point in gases in which a moisture-dependent electrical quantity used for indicating the formation of dew droplets on a sensor surface is held by controlling the temperature of the sensor surface at a desired value associated with a stable dew mass and the temperature of the sensor surface is measured, characterized in that for setting the desired value the temperature of the sensor surface is lowered from a value lying above the dew point temperature and a periodic time temperature variation is superimposed on the lowering, and that on simultaneous occurrence of periodic time variations of the moisture-dependent electrical quantity the value of the moisture-dependent electrical quantity measured on the change of the periodic time variations to a monotonic variation is used as the desired value.

14. Arrangement for measuring the water vapour dew point in gases including a dew point sensor comprising an electrical sensor element which comprises a sensor surface and which furnishes an electrical signal dependent on the moisture-dependent electrical quantity, an electrical heating and cooling means influencing the temperature of the sensor surface and an electrical temperature sensor furnishing an electrical signal dependent on the temperature of the sensor surface, and a control arrangement which is connected to the dew point sensor and receives the moisture-dependent electrical quantity as controlled variable and supplies to the electrical heating and cooling means a correcting variable by which the moisture-dependent electrical signal is held at a desired value, characterized in that the control arrangement includes a master controller and a follow-up controller which are arranged in cascade, that the master controller receives the moisture-dependent electrical signal as controlled variable and the desired value of the moisture-dependent electrical signal as command variable and emits a temperature desired value signal and that the follow-up controller receives the temperature desired value signal furnished by the master controller as command variable and the temperature-dependent signal furnished by the temperature sensor as controlled variable and supplies the correcting variable to the electrical heating and cooling means.

4,898,477

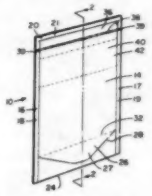
SELF-EXPANDING FLEXIBLE POUCH

William A. Cox; James B. Camden, both of Cincinnati, and George L. Roseberry, Fairfield, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 18, 1988, Ser. No. 259,380

Int. Cl.[4] B65D *33/00*

U.S. Cl. 383—33 **27 Claims**



1. A sealed, self-expanding, flexible pouch having a top portion and a throat area subjacent said top portion, said pouch comprising:

(a) front and back sidewall panels superimposed over one another and sealed together along their top, side, and bottom peripheral edges, said panels having an inner surface; and

(b) an extensible stay attached to said inner surface of said front and back sidewall panels and located in said throat area of said pouch, said extensible stay having a relaxed, expanded configuration and a stressed, collapsed configuration, said stay initially being held in its said stressed, collapsed configuration by said top portion of said pouch, whereby said stay expands to its said relaxed, expanded configuration when said top portion of said pouch is removed, thereby expanding said throat area of said pouch.

4,898,478

LINEAR GUIDE APPARATUS

Nobuyuki Osawa, Takasaki, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 9, 1989, Ser. No. 364,653

Claims priority, application Japan, Jan. 17, 1988, 63-80229

Int. Cl.[4] F16C *29/06*

U.S. Cl. 384—45 **3 Claims**

1. In a linear guide apparatus including an elongated guide rail having axial ball rolling grooves formed in both side surfaces in parallel to one another, a slider main body mounted on said guide rail for movement in an axial direction and having ball rolling grooves formed in an inner surface respectively opposing the ball rolling grooves of said guide rail, said slider main body also having ball return paths formed in side walls thereof in parallel to the ball rolling grooves in the inner surface of the slider main body, end caps respectively joined to opposite ends of said slider main body, each of said end caps having curved paths of a half circular shape for bringing the ball return paths into communication with the ball rolling

grooves, and a plurality of balls rollably inserted into the opposing ball rolling grooves, the ball return paths, and the curved paths, the improvement comprising:

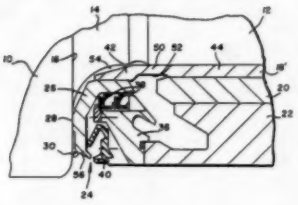
a boundary ridge portion formed in each of the ball rolling grooves of said guide rail and said slider main body between a groove flank face and a land face, the boundary ridge portion being formed in a circular arc shape continuously connecting the groove flank face and the land face.

4,898,479

ROLL NECK BEARING ASSEMBLY AND INNER BEARING COMPONENT THEREFOR

Thomas E. Simmons, Westford, Mass., assignor to Morgan Construction Company, Worcester, Mass.

Division of Ser. No. 31,416, Mar. 30, 1987, Pat. No. 4,790,673.
This application Jun. 24, 1988, Ser. No. 211,242
The portion of the term of this patent subsequent to Dec. 13, 2005, has been disclaimed.
Int. Cl.[4] F16C *33/74*
U.S. Cl. 384—130 **5 Claims**



1. An inner bearing component for a rolling mill roll neck bearing assembly, said inner bearing component being adapted to be axially received on the roll neck and comprising: a body portion adapted to coact with other components of the bearing assembly in radially supporting the roll neck, and an end portion spaced axially from and integrally joined to said body portion by an intermediate web portion of reduced radial thickness as compared to the radial thicknesses of adjacent segments of said body and end portions, said end portion being spaced radially from the roll neck and being configured and dimensioned to deflect radially inwardly towards said roll neck under the influence of radially inwardly applied forces.

4,898,480

COMPACT FERROFLUIDIC ELECTRICALLY CONDUCTING SEALED BEARING

Kuldip Raj, Merrimack; Hanumaiah L. Gowda, Hudson, and Ronald Moskowitz, Hollis, all of N.H., assignors to Ferrofluidics Corporation, Nashua, N.H.

Division of Ser. No. 12,193, Feb. 9, 1987, Pat. No. 4,797,013.
This application Oct. 27, 1988, Ser. No. 263,539
Int. Cl.[4] F16C *33/82*
U.S. Cl. 384—446 **18 Claims**

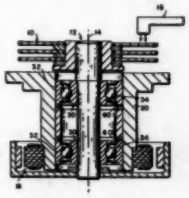
1. A sealed rolling element bearing for supporting a shaft of magnetic or nonmagnetic material and for permitting rotation of the shaft relative to a housing, comprising:

an inner race attachable to the shaft, said inner race having an annular outer surface;

an outer race concentric with said inner race and attachable to the housing, said outer race having an annular inner surface;

a plurality of rolling elements located in an annular region between said inner race and said outer race;

a pair of shields attached to the outer surface of said inner race and extending outwardly from the outer surface of said inner race toward the inner surface of said outer race on opposite sides of said rolling elements so as to substantially enclose said annular region, each of said shields having a closely-spaced, noncontacting relationship with the inner surface of said outer race thereby defining a gap between each of said shields and the inner surface of said outer race,



said inner race, said outer race, said rolling elements and said shields being of magnetically permeable material;

magnetic means for producing a magnetic field in said gaps and in regions where said rolling elements contact said inner race and said outer race; and

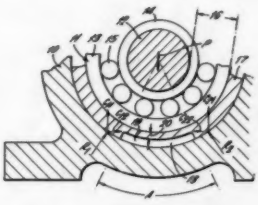
a ferrofluid retained by said magnetic field in the gaps between said shields and said outer race and in the regions where said rolling elements contact said races, said ferrofluid permitting relative rotary movement of said housing and said shaft while sealing opposite ends of said bearing and lubricating said rolling elements and creating a reservoir to replenish any fluid loss, wherein at least a portion of each of said shields is angled toward said rolling elements, and said inner and outer races have equal axial dimensions.

4,898,481

BEARING ASSEMBLY

Ronald F. Hamblin, Luton, United Kingdom, assignor to SKF (UK) Limited, United Kingdom

Filed Apr. 12, 1988, Ser. No. 180,391
Claims priority, application United Kingdom, Apr. 13, 1987, 8798772
Int. Cl.[4] F16C *27/04*
U.S. Cl. 384—581 **9 Claims**



1. A bearing assembly comprising a housing having a bore, a bearing which is disposed in the bore and a shaft which is supported by the bearing for rotation with respect to the hous-

ing, wherein the bearing is supported substantially over its complete circumference by at least two portions of differing stiffness, which are circumferentially adjacent to each other and extend longitudinally of the bearing, each less stiff portion being arcuate and centered on the bearing axis, such that the reaction to a load acting along a radius of the bearing includes substantial components to each side of that radius which are opposed to each other.

4,898,482

REPLACEABLE SHIM

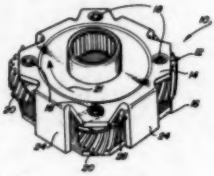
Matthew M. Stewart, 26468 Hickory Blvd., Bonita Beach, Fla. 33923

Continuation-in-part of Ser. No. 57,328, Jun. 4, 1987, Pat. No. 4,775,250. This application Oct. 3, 1988, Ser. No. 252,785

The portion of the term of this patent subsequent to Oct. 4, 2005, has been disclaimed.

Int. Cl.[4] F16C *33/00*; F16H *35/08*; F16B *43/00*

U.S. Cl. 384—626 **5 Claims**



1. For use in conjunction with a member rotatably mounted to a shaft, said shaft being secured to a frame, said shaft normally moving in a predetermined transverse direction, a shim comprising:

a flat body having a recess with an open end, said body being insertable between said frame and said rotary member so that said shaft is positioned within said recess, and

means for locking said body to said frame so that said open end of said recess faces in said predetermined transverse direction, and so that said shaft remains in said recess comprising a surface on said body adapted to abut against a surface on said frame, said body surface being spaced from and facing substantially away from said recess; wherein said body and said locking means are of one-piece construction.

4,898,483

ELECTRONIC TYPEWRITER EQUIPPED WITH A PERSONAL COMPUTER

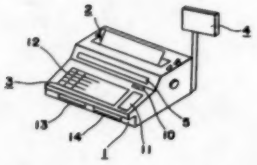
Taiji Iizuka, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 7, 1988, Ser. No. 141,514

Claims priority, application Japan, Jan. 9, 1987, 62-3608

Int. Cl.[4] B41J *5/40*

U.S. Cl. 400—61 **6 Claims**



1. An electronic typewriter equipped with a personal computer comprising:

a first processing unit including,

processing means for controlling operations of said first processing unit,

storing means for storing a user application program, and

display means for displaying data processed according to user application program;

interface means, operatively connected to said first processing unit, for transferring data to and from said first processing unit;

a second processing unit, coupled to said first processing unit through said interface, for controlling a printer according to data transferred from said interface;

keyboard means, including character input keys and function keys, for inputting data to a selected one of said first processing unit or said second processing unit, exclusive of the other;

selection switch means, operatively connected to said first processing unit and said second processing unit, for selecting one of two modes, said modes causing only one of said first processing unit or said second processing unit to operate and receive said inputted data; and

distribution means, operatively connected to said keyboard means, for distributing data outputted from said keyboard means to either said first processing unit or said second processing unit according to the mode selected by said selection switch means, said data being processed by either said first processing unit or said second processing unit according to the mode selected.

4,898,484

THERMAL TRANSFER PRINTER

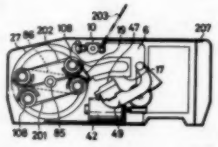
Yunji Aoyagi; Syouji Yokoyama, and Tomohiko Yanagita, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 832,130, Feb. 24, 1986, abandoned. This application Sep. 22, 1988, Ser. No. 248,287

Claims priority, application Japan, Feb. 27, 1985, 60-38161

Int. Cl.[4] B41J *35/22*

U.S. Cl. 400—120 **15 Claims**



1. A thermal transfer printer comprising:

a case; side plates respectively provided at opposite sides of said case; a platen mounted between said side plates; a roller mounted between said side plates in pressure contact with said platen; a plurality of interchangeable rolls of ink film ribbon, each with an ink layer wound around a supply roll and arranged to be taken up around a take-up roll in an ink film take-up direction by a force transmitted from said platen; recording paper disposed in opposition to the ink layer on one of said ink film ribbons which is fed to a predetermined recording position by said platen; a thermal head including an array of heating elements disposed along an axial direction of said platen, said heating elements being pressed against said platen through said one ink film ribbon and said recording paper; means operatively disposed in said case for feeding said recording paper; means operatively disposed in said case for feeding said one ink film ribbon; means rotatably mounted in said case between said side plates for supporting said thermal head, said thermal head being operatively arranged to be brought against said one ink film ribbon heated in accordance with recording information and transferring an ink image onto a surface of said recording paper; said plurality of interchangeable rolls of ink film

ribbon being accommodated in said case and each being contained in ink ribbon-containing cassettes; driving means operatively provided in said case for driving said thermal head supporting means and for setting a clearance between said platen and said thermal head by rotation of said thermal head supporting means, said driving means being operable to open the clearance between said platen and said thermal head in response to an interchange of said rolls of ink film ribbon, with the clearance having a width not less than a maximum diameter of one roll of said ink film ribbon, to allow a first roll of said rolls of ink film ribbon to be moved in a direction substantially perpendicular to a longitudinal axis of said platen without translation along said longitudinal axis and parallel to the ink film take-up direction to the predetermined recording position from a storing position and to be retracted from the predetermined recording position to the storing position, and a second roll of said rolls of ink film ribbon to be interchanged with the first roll by being moved from the storing position to the predetermined recording position while said recording paper remains stationary during the interchange to assure a smooth subsequent printing operation;

an electric controller for controlling said driving means and for effecting the interchange of said rolls of ink film ribbon; and

means provided in said case for guiding and positioning said ink film ribbon in relation to the predetermined recording position.

4,898,485

METHOD AND APPARATUS FOR MARKING ON AN ARCUATE SURFACE

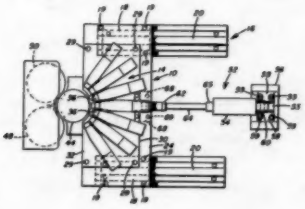
Edwin W. Speicher, Pittsburgh, Pa., assignor to M. E. Cunningham Company, Ingomar, Pa.

Continuation of Ser. No. 157,920, Feb. 19, 1988, which is a continuation of Ser. No. 930,660, Nov. 13, 1986, abandoned. This application Mar. 3, 1989, Ser. No. 320,292

The portion of the term of this patent subsequent to Jul. 18, 2006, has been disclaimed.

Int. Cl.[4] B41J *3/10*

U.S. Cl. 400—121 **11 Claims**



1. Apparatus for marking on an arcuate surface comprising,

marking means for marking the circumference of an object having an arcuate surface with a plurality of characters of preselected height, said marking means including a plurality of marking head assemblies spaced from each other by a preselected angular distance to form a generally fan-shaped array,

said plurality of marking head assemblies angularly spaced from a circumference of said object by a preselected degree to control said height of said characters,

mounting means for supporting said marking means,

object support means for supporting said object having said arcuate surface, said object support means positioned to provide that a longitudinal axis of said object is substantially perpendicular to said plurality of marking head assemblies,

positioning means for positioning said arcuate object on said object support means, and

means to actuate said plurality of marking head assemblies to selectively imprint a plurality of marks in the circumference of said arcuate object and form said plurality of characters.

4,898,486

THERMAL TRANSFER RIBBON, ESPECIALLY FOR IMPRESSIONS ON ROUGH PAPER

Norbert Mecke, Hannover, and Heinrich Krauter, Neustadt, both of Fed. Rep. of Germany, assignors to Pelikan Aktiengesellschaft, Hannover, Fed. Rep. of Germany

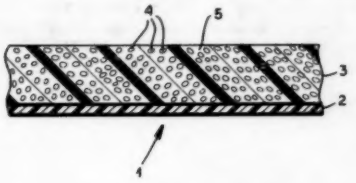
Continuation-in-part of Ser. No. 109,489, Oct. 15, 1987. This application Feb. 10, 1988, Ser. No. 154,651

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1986, 3635141

The portion of the term of this patent subsequent to Jan. 23, 2007, has been disclaimed.

Int. Cl.[4] B41J *31/00*

U.S. Cl. 400—241.2 **10 Claims**



1. A thermal-transfer ribbon, comprising:

a support strip; and

a thermally transferable image-transfer layer on said support strip comprising a solid continuous phase in which a coloring agent is dispersed, a coloring-agent-containing discontinuous phase consisting of solid beads of a polymer meltable during the thermal-transfer process and distributed in said continuous phase, said solid continuous phase being formed by at least in part.

4,898,487

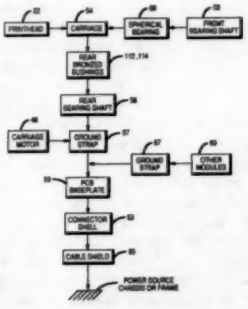
PRINT HEAD CARRIAGE FOR MATRIX PRINTER

Robert A. Brull, Dryden; James R. Del Signore, II, Trumansburg, and Alan H. Walker, Barton, all of N.Y., assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 8, 1988, Ser. No. 282,226

Int. Cl.[4] B41J *11/22*

U.S. Cl. 400—354 **4 Claims**



1. A printer for serial printing of indicia on record media, comprising a

printer frame, a

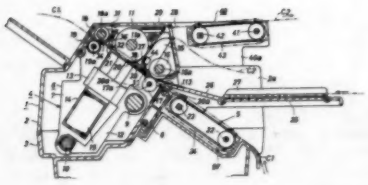
print head carriage, a
print head secured to said carriage, and
shaft means secured to said printer frame and supporting said print head carriage for transverse movement along said shaft means in printing operations, said print head carriage including bearing means and said carriage being made of a conductive material comprising polycarbonate with polytetrafluoroethylene and carbon material wherein said print head is bonded through said bearing means and through said shaft means to the ground potential of said printer.

4,898,488

PRINTER WITH MULTI-FUNCTION PAPER FEEDING MECHANISM

Takeshi Yokoi, Kagamigahara; Shigeo Nakamura, and Hiroshi Yamanaka, both of Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed Aug. 21, 1987, Ser. No. 87,827
Claims priority, application Japan, Aug. 22, 1986, 61-197916; Mar. 28, 1987, 62-74980; Apr. 7, 1987, 62-86125
Int. Cl.[4] B41J *13/30, 11/22*
U.S. Cl. 400—642 **3 Claims**



1. A printer comprising a platen, a print head which faces said platen so as to print out on a sheet of printing paper at a printing position on said platen, a paper guide path for guiding the printing paper through said printing position, and a guide means having a guide plane for inserting a sheet of printing paper in said guide path;

wherein said paper guide path comprises a paper inlet portion at one end thereof for inserting the printing paper thereto and a paper discharge portion at the other end thereof for discharging the printing paper therefrom,

wherein said paper guide path is a substantially flat path extending from said paper inlet portion to said paper discharge portion, said path slanting upward to the paper feed direction so that said paper inlet portion is located lower than said paper discharge portion, said paper guide path being formed between a guide member and a paper path member, said guide member being disposed on the upper side of a tangent line of the printing position on said platen and said paper path member being disposed on the lower side of the tangent line thereof,

wherein said guide plane of said guide means is connected with said paper inlet portion of said paper guide path and meets said paper guide path at an obtuse angle, a resilient film attached to an edge of said guide means and projecting toward said paper guide path and a free edge of the film being disposed adjacent to said paper path member, and pin tractor means located below said guide means for feeding a continuous web, said web having pin feed holes along outer edges engageable with said pin tractor means, into said paper guide path through a space between said resilient film and said paper path member, and

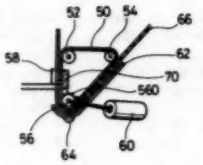
said guide means and said pin tractor being located adjacent the paper inlet portion.

4,898,489

PAPER SUPPORT MECHANISM IN A PRINTER

Junichiro Matsumoto; Mitsuhiro Shimada, and Yoichi Yamamoto, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 23, 1984, Ser. No. 643,470
Claims priority, application Japan, Aug. 26, 1983, 58-156749
Int. Cl.[4] B41J *11/08*
U.S. Cl. 400—656 **8 Claims**



1. A paper feed/support mechanism for a printer which has a thermal print head adapted to travel in a horizontal plane, said print head containing a plurality of heating elements which are aligned in a direction extending substantially perpendicular to the direction of travel of the print head which comprises:

an endless elastic sheet member having a width extending over a printing zone of said printer;

at least two roller members forming a conveying surface for extending said endless sheet member in front of said print head, said at least two roller members including a pair of rollers which form, in combination, a flat conveying surface in front of said print head, said flat surface having a height, measured in the direction perpendicular to the direction of travel of the print head, greater than the height of the heating elements of said print head; and

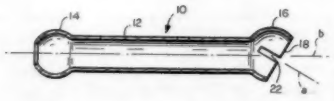
a drive mechanism connected to at least one of said at least two roller members so as to rotate said endless sheet member around said at least two roller members in a plane substantially perpendicular to the traveling direction of the print head.

4,898,490

STRUCTURE FORMED FROM BALL JOINTED LINKS

Alfred F. Herbermann, Ann Arbor, and Robert M. Carabbio, Saline, both of Mich., assignors to Syron Engineering and Manufacturing Corporation, Saline, Mich.

Filed Feb. 19, 1988, Ser. No. 158,305
Int. Cl.[4] F16C *11/06*
U.S. Cl. 403—56 **10 Claims**



1. A structure which is adapted to support a load, said structure comprising:

a first link, said first link having;

an elongate metallic central portion extending along a central axis; and

a ball portion having a part-spherical outer surface, said ball portion being attached to said central portion of said first link at an end of said central portion of said first link; and

a second link, said second link having;

a socket portion having a part-spherical inner surface and an opening at an extremity of said socket portion, said socket portion being attached to said central portion of said

second link at an end of said central portion of said second link;

said ball portion of said first link being engaged in said socket portion of said second link with said elongate central portion of said first link extending through said opening in said socket portion of said second link;

said first link initially being capable of limited universal movement with respect to said second link when said ball portion of said first link is engaged in said socket portion of said second link;

securing means securing said ball portion of said first link to said socket portion of said second link in a predetermined, load bearing position of said second link with respect to said first link; and

said extremity of said socket portion defining an end face at a first plane, a second plane being defined perpendicular to said central axis of said elongate central portion, said first plane and said second plane intersecting at an acute angle.

4,898,491

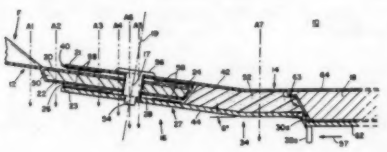
LOCKING PIVOT ASSEMBLY WITH BOTH PIVOT AND TILT AXES

Kip Van Steenburg, Sudbury, Mass., assignor to Amatech Corporation, Acton, Mass.

Continuation-in-part of Ser. No. 710,050, Mar. 11, 1985, Pat. No. 4,698,837. This application Oct. 5, 1987, Ser. No. 104,839

Int. Cl.[4] F16C *11/04*

U.S. Cl. 403—96 **20 Claims**



1. A pivot assembly comprising:

a rotating member for supporting a load;

a mounting member for supporting said rotating member;

means for pivotably interconnecting said rotating member and said mounting member to enable rotation about a pivot axis, and for inhibiting translation of said rotating member relative to said mounting member along said pivot axis;

means for enabling tilting of said rotating member about a tilt axis transverse to said pivot axis;

said rotating member and said mounting member overlapping to define at least one pair of adjacent sections; and

means for providing releasable gripping between said adjacent sections, responsive to the loading and tilting of said rotating member, to inhibit relative rotation about said pivot axis, by increasing grip between said adjacent sections when said rotating member supports a load and is torqued about said tilt axis in a first direction, and to permit relative rotation about said pivot axis by releasing grip when said rotating member is tilted about said tilt axis in a second and opposite direction, releasing said torque.

4,898,492

PRESSURE CLOSING DEVICE FOR JOINING THE EDGES OF PLASTIC SHEETS

Valery Janowski, Paris, France, assignor to Gefrem, Avallon, France

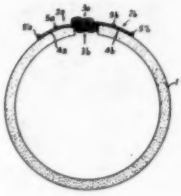
Filed Mar. 17, 1987, Ser. No. 26,919

Claims priority, application France, Mar. 17, 1986, 86 03759

Int. Cl.[4] F16D *1/00*; B65D *33/24*

U.S. Cl. 403—340 **3 Claims**

1. In a pressure closing strip for joining two edges of cellular sheet material, wherein said strip comprises longitudinally extending hook means for interconnection with like hook means of a complementary pressure closing strip and a longitudinally extending flap having one face adapted to be welded to the sheet material along an edge thereof, and wherein said flap has a first lateral edge attached to said hook means and a second lateral edge opposite the first, the improvement com-



prising a first longitudinal rib, discrete from said hook means, protruding from only one face of said flap intermediate said first and second edges to reinforce the flap against wrinkling, and further comprising a second rib extending along said second edge parallel to said first rib and protruding from only one face of said flap.

4,898,493

METHOD AND APPARATUS FOR ASSEMBLING PARTS

Karl Blankenburg, 42050 Executive Dr., Mt. Clemens, Mich. 48045-3488

Filed Mar. 16, 1989, Ser. No. 324,452

Int. Cl.[4] B25G *3/00*

U.S. Cl. 403—407.1 **8 Claims**

1. A system for joining parts together in spaced relationship such as opposed panels which comprises:

(a) a plurality of carrier elements,

(b) a plurality of receiver elements,

(c) means on said elements to interlock in engagement when said elements are moved axially into a juxtaposed position,

(d) a first part fastened to one or more carrier elements by conventional fastening means,

(e) a second part fastened to one or more receiver elements by conventional fastening means,

(f) said parts being joined together when said carrier element and receiver element are moved together,

(g) said carrier elements comprising a hollow cylindrical body portion having a perforate top to receive bolt fasteners and resilient, dependent leg portions, a lateral latch projection on each of said leg portions, and

(h) said receiver elements comprising a hollow cylindrical body portion dimensioned to have a sliding fit with said carrier element, and apertures formed in the wall of said receiver elements to receive said latch portions in an interlock engagement when said elements are telescoped together.

4,898,494

SUBSURFACE WATER DRAINAGE SYSTEM

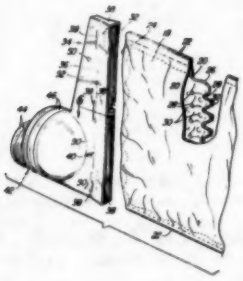
Donn Ellis, 3624 Chevron Dr., Highland, Mich. 48031

Continuation-in-part of Ser. No. 49,856, May 13, 1987, Pat. No. 4,793,728. This application Aug. 23, 1988, Ser. No. 235,196

The portion of the term of this patent subsequent to Dec. 27, 2005, has been disclaimed.

Int. Cl.[4] E01C *11/22*

U.S. Cl. 404—002 **14 Claims**



1. A drainage system outlet member comprising facing resiliently deformable platelike side members, said side members being joined along opposite pairs of upper and lower edges of each by ridges and being spaced from each other between said ridges, said side members having paired flared portions extending laterally of said ridges and providing flared openings in said outlet member,

stops projecting inwardly of said side members at spaced locations thereof with the stops of one side member facing the stops of the other side member and serving to limit inward movement of one of said side members relative to the other,

a series of vertically extending projections extending inwardly of each of said platelike side members intermediate said flared portions and said stops and forming means for retaining by impingment material inserted into said outlet member beyond said projections,

one of said side members having a drain opening formed therein adjacent the lower of said ridges and inwardly of said flared ends,

a drain connector in said drain opening for connection to a drainage means for draining fluid away from said outlet member.

4,898,495

METHOD AND APPARATUS TO CONTROL A BEACH AT AN INLET AND TO MAINTAIN THE BEACH

Newman K. Lin, 22648 SW. 54th Ave., Boca Raton, Fla. 33433

Filed Nov. 17, 1988, Ser. No. 272,392

Int. Cl.[4] E02B *3/02*

U.S. Cl. 405—73 **66 Claims**

1. For beach erosion control and maintenance control at an inlet, a method for bypassing the littoral drift of a body of water from the upstream beach of an inlet having an entrance to the downstream beach of the inlet, wherein the downstream beach is of porous media comprising the steps of:

during flood tides, trapping the sediment carried by a littoral drift, with an inflow into a sediment trapping means anchored on the bottom of a body of water, around the entrance of said inlet, said trapping means comprising at least one assembled diffuser frame, trapping pipeline means and reversible pump means to vacuum water out of said sediment trapping means, said sediment trapping means having an outflow path,

re-suspending the trapped sediment of the outflow path discharged of said sediment trapping means into said body of water, to form a regenerated littoral drift, when an ebb tidal current is weak, said outflow path resulting from water flowed into said sediment trapping means by said reversible pump means, and

generating a water flow by a diffuser means installed on the floor of the water body between the downstream beach and said inlet, to direct said regenerated littoral drift toward the downstream beach, said diffuser means comprising a diffuser with flow deflector means and pipe means including check valve means on the pipe means, said pipe means interconnecting said diffuser means and said trapping means, and accepting fluid flow from said trapping means.

4,898,496

APPARATUS FOR UNDERGROUND TUNNELING

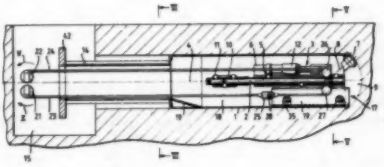
Ludwig Pfeiffer, Kassel, and Wilfried Werner, Zierenberg, both of Fed. Rep. of Germany, assignors to MTS Miniltunnelsysteme GmbH, Kassel, Fed. Rep. of Germany

Filed Sep. 2, 1988, Ser. No. 241,005

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1987, 3729561

Int. Cl.[4] E21D *9/08*

U.S. Cl. 405—141 **10 Claims**



1. Apparatus for underground tunneling, especially for tunnels of unwalkable cross section, containing: a working tube (1) having an axis (4), which can be urged forward in the direction of the tunnel in formation, a digging unit (3) which is mounted in the working tube and can be pushed past the front end of the working tube, and which is movable radially of its axis and bears a partial-face cutter for loosening the dirt in front of the working tube and can be set for a substantially smaller outside cross section in comparison to the inside cross section of the working tube, and a carrier system for the removal of the dirt loosened in the driving of the tunnel, the carrier system containing a scoop (19) which is movable underneath the digging unit substantially parallel to the working tube axis and contains a transport system (21–24) coupled to the scoop; the scoop being mounted on the floor of the working tube (1) such that it can be pushed forward partially past its front end and withdrawn again fully into the working tube, and has at its front end a mouth (20) of shovel-like configuration for the loading of the loosened dirt; and wherein the transport system contains a reversible drive mechanism for moving the scoop back and forth when loading, for withdrawing the scoop (19) rearwardly from the working tube (1) for the removal of the dirt, and for returning the scoop (19) into the working tube (1) after it has been emptied.

4,898,497

METHOD FOR CEMENTITIOUS COATING OF PIPE AND FORMS FOR USE THEREWITH

Keith R. Behr, 8201 W. Montebello, Glendale, Ariz. 85303

Filed Jan. 28, 1988, Ser. No. 149,524
Int. Cl.[4] F16L *1/02, 9/04*
U.S. Cl. 405—154 10 Claims

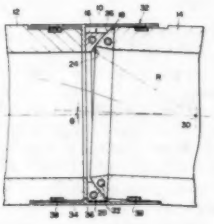
1. A method of coating pipe with a layer of cementitious material at a job site, comprising the steps of:
(a) providing a plurality of pipe sections;
(b) connecting the pipe sections at the job site to form a length of pipe;
(c) progressively coating the length of pipe with the cementitious material;
(d) supporting the uncured coating of cementitious material about the length of pipe on support forms having a concave support surface; and
(e) curing the cementitious material.

4,898,498

THRUST TRANSMITTING DEVICE

Toshio Akesaka, Yokohama, Japan, assignor to Kabushiki Kaisha Iseki Kaihatsu Koki, Tokyo, Japan

Filed Oct. 5, 1988, Ser. No. 253,853
Claims priority, application Japan, Dec. 7, 1987, 62-307687
Int. Cl.[4] F16L *1/00*
U.S. Cl. 405—184 5 Claims



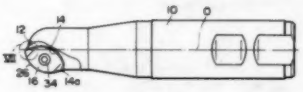
1. A thrust transmitting device disposed between a pair of adjacent pipes for transmitting a thrust from one of the pipes to the other, comprising a first ring provided on one side with a spherical concave surface and a second ring provided on one side with a spherical convex surface adapted to abut relatively slidably against said concave surface of said first ring, at least one of said rings being slidably mounted for movement in the radial direction of said rings with respect to both pipes and the other ring whereby said at least one of said rings can move in the radial direction when the pipes are thrust along a curved path.

4,898,499

BALL END MILL

Osamu Tsujimura, Kawasaki; Tatsuo Arai, Kitamoto; Masaaki Nakayama, Tokyo, and Masayuki Okawa, Kawasaki, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 4, 1988, Ser. No. 164,442
Claims priority, application Japan, Mar. 4, 1987, 62-31257[U]; Mar. 19, 1987, 62-40257[U]; Jul. 13, 1987, 62-107229[U]; Jul. 13, 1987, 62-107230[U]; Aug. 5, 1987, 62-120179[U]; Nov. 25, 1987, 62-179344[U]; Nov. 25, 1987, 62-179343[U]; Jan. 26, 1988, 63-8710[U]
Int. Cl.[4] B23C *5/14, 5/02*
U.S. Cl. 407—42 13 Claims



3. A ball mill end comprising:
an end mill body having an axis of rotation therethrough and having forward and rearward end portions; and
an indexable first cutter insert releasably attached to said forward end portion of said body, said insert comprising a plate defined by a front face, a rear face and a plurality of pairs of first and second side faces disposed alternately and lying between said front face and said rear face, each of said first side faces cooperating with said front face to define a main cutting edge which is generally arcuately shaped when viewed in a direction perpendicular to said front face, each of said second side faces cooperating with said front face to define a secondary cutting edge, said secondary cutting edges being shorter than said main cutting edges, each of said main cutting edges having a leading end portion which intersects one of said secondary cutting edges at an obtuse angle and a trailing end portion which intersects the another of the secondary cutting edges, said front face serving as a rake surface for said main and secondary cutting edges and having a pair of marginal surface portions each disposed between the leading end portion of one of said main cutting edges and the trailing end portion of the other main cutting edge, said marginal surface portion being convexly curved so as to slope toward said rear face toward said secondary cutting edge;
the arrangement of said first insert with respect to said body being such that said leading end portion of said main cutting edge is disposed adjacent to said axis of said body, and that said secondary cutting edge extends from said leading end portion beyond said axis of said body toward said rearward end portion of said body when viewed in a direction generally perpendicular to said front face so that said secondary cutting edge lies substantially opposite said axis from said main cutting edge.

4,898,500

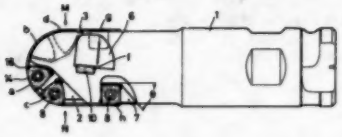
BALL END MILL WITH THROW AWAY INSERT

Naohiro Nakamura; Yoshikatsu Mori, and Keiji Honda, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Sep. 16, 1988, Ser. No. 245,178
Claims priority, application Japan, Sep. 17, 1987, 62-143290[U]
Int. Cl.[4] B23C *5/12*
U.S. Cl. 407—62 5 Claims

1. A ball end mill with throw away inserts, comprising a body formed in its hemispherical front end at diametrically opposite positions with two first insert mounting pockets, said pockets being formed each with a plurality of insert mounting

seats, and first throw away inserts having an arcuate cutting edge and mounted in said respective insert mounting seats so that when said mill is rotated, the locuses of said cutting edges will generate a hemisphere and overlap by more than a quarter of the length of each cutting edge, the inserts closer to the front end of said body having an axial rake of 0–5 degrees and the inserts at the rear having an axial rake of 4–8 degrees, the latter inserts having a larger axial rake than the former, the latter insert in each pocket having the leading end of its cutting edge



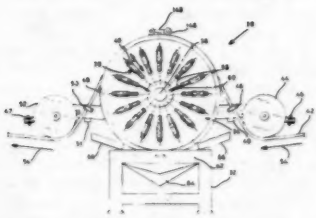
located on the extension line of the cutting edge of the former insert mounted in the same pocket, whereby said cutting edges form substantially an S-shaped line as viewed from the front of the body, said first inserts being of a substantially regular polygonal shape and of a positive type having their cutting edge arcuately convexed with a radius which is equal to one another and larger than that of the imaginary circle which circumscribes said each insert at the noses thereof, said inserts being formed on each side face thereof with a flat surface having a larger relief angle than that of the side face.

4,898,501

IN LINE ROTARY DRILING MACHINE FOR PRODUCING UNIFORM OPENINGS IN CONTINUOUS STRIP MATERIAL

Larry R. Palmer, Harriman, Tenn., assignor to Tennessee Tool and Engineering, Inc., Oak Ridge, Tenn.

Filed Jun. 14, 1989, Ser. No. 366,758
Int. Cl.[4] B23B *39/20, 41/00*
U.S. Cl. 408—32 **20 Claims**



1. A machine for the drilling of holes of selected uniform size and selected uniform spacing in a moving continuous strip base material, which comprises:

a frame means;

a rotatable drum means adjustably mounted on said frame means, said drum means provided with a substantially circular periphery for carrying said strip base material on a selected portion thereof, said drum means provided with radial openings at positions along said periphery corresponding to said spacing of said holes, said drum means further provided with radial slots directed toward said openings;

means for rotating said drum means at a selected angular speed around an axis to produce a selected linear speed of said periphery;

means for holding a surface of said strip base material against said selected portion of said periphery of said drum means;

a plurality of drill units mounted on said drum means, said drill units each associated with one of said slots in said drum means, said drill units including a drill bit for said selected size hole oriented with selected of said radial openings;

means associated with each said drill units for rotating said drill bits; and

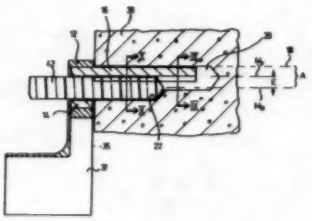
means for moving said drill units in a selected sequence in a radial direction related to said axis whereby selected ones of said drill bits engage said strip base material against said selected portion of said periphery to drill said holes, and whereby other selected ones of said drill bits are withdrawn from said strip base material to permit withdrawal of said strip base material from said periphery.

4,898,502

MECHANICAL DRILLING AID

Reinhard Becher, Engelbergstrasse 42, D-7000 Stuttgart 31, Fed. Rep. of Germany

Filed Dec. 19, 1988, Ser. No. 286,627
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1988, 3833040
Int. Cl.[4] B23B *49/02*
U.S. Cl. 408—72 B **15 Claims**



1. Mechanical drilling aid for guiding a drilling tool when drilling a correct bore into an object, in particular into a wall, said correct bore to be drilled being disposed eccentrically to an existing faulty bore, wherein the cross-sections of said faulty bore and said correct bore to be drilled intersect each other or extend immediately adjacent to each other, comprising:

a guide element provided with an opening therein having a cylindrical wall serving for guiding said drilling tool, said cylindrical wall defining a circle at least as large as the circumferential circle of said drilling tool and having a longitudinal center axis coaxial with the axis of the drilling tool, and

a rod-shaped part projecting from said guide element, said rod-shaped part being introducible into said faulty bore and abutting against an inner wall of said faulty bore, at least along an outer edge of said rod-shaped part, said rod-shaped part being detachable from said guide element so that it can be left in said object, thereby filling a space between said correct bore and said faulty bore,

wherein the distance between said outer edge of said rod-shaped part and said longitudinal center axis of said cylindrical wall in said guide element is equal to the sum of the amount of eccentricity between said faulty and said correct bore, and the radius of said faulty bore, wherein said distance is measured across a center point of said cross-section of said faulty bore.

4,898,503

TWIST DRILL

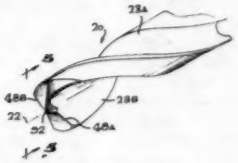
Herman B. Barish, Woodland Hills, Calif., assignor to Lockheed Corporation, Calif.

Filed Jul. 5, 1988, Ser. No. 215,175
Int. Cl.[4] B23B *51/02*
U.S. Cl. 408—230 **8 Claims**

1. A split-point, two-fluted twist drill having:

a helix angle of the flutes of between 28 and 32 degrees;

a web thickness at the point prior to splitting of between 23 and 27 percent of the drill diameter;
a point angle of between 132 and 138 degrees;
a web taper from said point to flute run out of 0.015 to 0.020 inches per inch;
a chisel-edge angle of between 115 and 121 degrees;



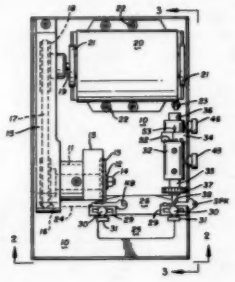
a splitting angle of between 127 and 137 degrees;
a primary cutting edge rake angle of between 10 to 14 degrees positive; and
a flat at the corner of the cutting edge rake of between 10 and 12 percent of the drill diameter.

4,898,504

KEY CUTTING MACHINE

Frank P. Agius, and Darrell E. Sims, both of 909 Washington St., Alpina, Mich. 49707

Filed Nov. 30, 1988, Ser. No. 277,778
Int. Cl.[4] B23C *01/16*
U.S. Cl. 409—81 **5 Claims**



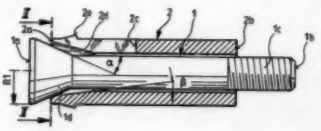
1. In a key cutting machine of the type having a base, a rotary cutter, a yoke movably supported on the base having a pair of clamps thereon for holding a spacing key and a key blank, an improved guiding apparatus, the improved guiding apparatus comprising: a body member having a transverse opening, said body member being on said base and having two spaced apart bores, with both bores being in spaced parallel relation to a plane containing said rotary cutter, a guide disc having a plurality of different depth cut-outs in an annular pattern on one side thereof, means for rotatably removably positioning said guide disc in said transverse opening in said body opening, a movable guide axially movable in one bore of said two spaced apart bores and having a spahed end protruding from said one bore for engagement with said spacing key, an adjustment ring adjustably positioned on said movable guide for movement axially of said movable guide, and a depth guide pin in the other bore of said two spaced apart bores in said body member having one end engaging said depth cut-outs in said disc and an opposite end engaging said adjustment ring, a resilient biasing means on said depth guide pin and located in said other bore and engaging said body member adjacent to said other bore for biasing said depth guide pin into engagement with said adjustment ring whereby said key blank may be guided toward said rotary cutter so as to cut said key blank in longitudinally spaced areas corresponding with said spacing key and to depths matching the depths of said cut-outs in said disc.

4,898,505

EXPANSION DOWEL ASSEMBLY WITH AN EXPANSION CONE DISPLACEABLE INTO AN EXPANSION SLEEVE

Peter Froehlich, Neuried, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft, Liechtenstein

Filed Nov. 18, 1988, Ser. No. 273,409
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1987, 3739608
Int. Cl.[4] F16B *13/06*
U.S. Cl. 411—55 **5 Claims**



1. An expansion dowel assembly for insertion into a borehole in a receiving material and having a leading end and a trailing end relative to the insertion direction of the dowel assembly into the borehole, the dowel assembly including an axially extending expansion sleeve with a leading end and a trailing end and a bore extending axially therethrough, said sleeve having a cylindrically shaped outer surface, said expansion sleeve having an axially extending expansion region adjacent the leading end thereof with the bore in said expansion region widening toward the leading end, said expansion sleeve having circumferentially spaced axially extending slots extending from the leading end toward the trailing end thereof and extending at least for the axial extent of the expansion region, and an axially extending anchor bolt having a leading end and a trailing end and extending through said bore in said expansion sleeve with the leading end of said anchor bolt having an expansion cone widening in the insertion direction and arranged to be drawn into the leading end of said expansion sleeve toward the trailing end thereof for expanding said expansion sleeve, wherein the improvement comprises that:
(a) said expansion cone has a cone angle and said expansion region has a cone angle and the cone angle of said expansion cone is larger than the cone angle of said expansion region;
(b) said expansion sleeve in said expansion region has a variable wall thickness in the circumferential direction with the wall thickness diminishing in the direction toward said slots, the radius of said outer surface of said expansion sleeve being centered on the axis thereof, said expansion sleeve having an inner surface eccentrically arranged relative to the axis thereof; and
(c) the outer surface of said expansion region has a circumferentially extending annular bear projecting outwardly from the outer surface of said expansion sleeve.

4,898,506

METHOD AND APPARATUS FOR MAKING A BOOK-BINDING

Peter Lázár, Tannenstr. 11, D-4040 Neuss 21, Fed. Rep. of Germany

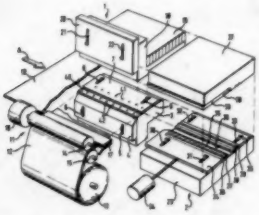
Filed Mar. 31, 1988, Ser. No. 176,338
Claims priority, application Fed. Rep. of Germany, May 14, 1987, 3716112
Int. Cl.[4] B42C *11/04, 7/00, 9/00*
U.S. Cl. 412—8 **20 Claims**

7. Apparatus for manufacturing a book cover, comprising:
(a) support means;

(b) feed means operably associated with said support means for supporting a board;

(c) feed means operably associated with said support means for causing a length of hot-melt strip material to be moved relative to the board and for being positioned below the board;

(d) said support means includes a plate defining a recess and having an upper surface for supporting the board and an edge portion engageable with an advancing edge of the strip material for causing the strip material to be stopped and thereby oriented relative to the overlying board and a base portion upon which the strip material is supported;



(e) punch means overlies said support means and are displaceable relative thereto for selectively engaging and pressing the board against the underlying strip material and thereby causing the board to be secured to the strip material; and,

(f) cutter means operably associated with said support means, underlying said recess and cooperating with said punch means for severing the strip material from said feed means as said punch means presses the board against the strip material.

4,898,507

APPARATUS FOR HANDLING ELECTRICAL OR ELECTRONIC COMPONENTS

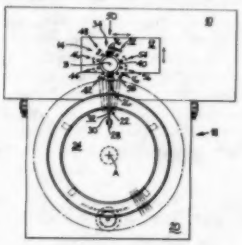
Victor T. Hawkswell, Witham, England, assignor to Dynapert, Inc., Beverly, Mass.

Filed Jan. 29, 1988, Ser. No. 150,101

Claims priority, application United Kingdom, Feb. 5, 1987, 8702617

Int. Cl.[4] B65H *5/08*

U.S. Cl. 414—225 **12 Claims**



1. Apparatus for handling electrical or electronic components comprising

a pick-up head having a pick-up tool,

a support on which the pick-up head is mounted, the support being mounted for movement, in the operation of the apparatus, to move said pick-up head between a pick-up station at which a component is picked up and a placement station at which the component is placed at a desired position,

means for displacing the support to move said pick-up head through one or more orientation stations intermediate the pick-up and placement stations,

orienting means, mounted at at least one orientation station, arranged to engage a pick-up head at that orientation station and rotate the tool about an axis of the head to a desired orientation,

said pick-up head including clutch means which normally retains the tool locked against rotation but which is released, to permit rotation of the tool, by relative axial movement of the orienting means and pick-up head into engagement with one another and which is re-engaged to prevent rotation of the tool when the orienting means and pick-up head are moved out of engagement, and

said orienting means at each orientation station including a drive member mounted coaxially with the axis of a pick-up head at that station for movement along the axis into and out of axial driving engagement with the tool of the pick-up head to displace said pick-up head between selected upper and lower positions and for rotation of the tool about the axis to change the orientation of the tool.

4,898,508

LOW SLUNG SMALL VEHICLE

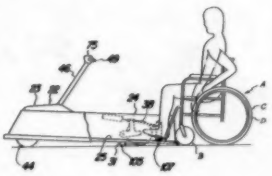
Osamu Hayata, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Jun. 30, 1987, Ser. No. 68,231

Claims priority, application Japan, Jun. 30, 1986, 61-151424

Int. Cl.[4] B62K *15/00*

U.S. Cl. 414—476 **17 Claims**



1. A vehicle having a load carrying floor suspended from at least a pair of rear wheels and at lease one dirigible front wheel, a body comprising front walls and side walls, said front walls and said side walls each having a generally inverted box shape and defining said floor and open at the rear edge of said vehicle, said front wheel being supported relative to said body for steering movement about a steering axis and for rotation about a rotational axis, power means fixed relative to said body comprising an engine contained within said front wall and driving transmission means comprising a differential position within said front wall and a pair of chains each driven by an output shaft of said differential and extending through a respective one of said side walls for driving a respective one of said rear wheels for propulsion of said vehicle, and means for suspending said floor for pivotal movement about said rotational axis of said front wheel and for movement relative to said rear wheels from a lowered position wherein said floor is angularly disposed relative to the ground and said front wheel rotational axis of the rear edge of said floor is lowered to a ground engaging position and a raised position wherein said floor extends substantially horizontally and the rear edge thereof is above the ground.

4,898,509

CARGO TRANSPORTER, PARTICULARLY OF THE TRAILER TYPE HAVING A FRONT ELEVATED LOADING FLOOR

Kees W. Thunnissen, Boslaan, Netherlands, assignor to Talson Transport Engineering, B.V., Heeze, Netherlands

Filed Mar. 31, 1987, Ser. No. 33,016
Int. Cl.[4] B60P 1/44
U.S. Cl. 414—495 **9 Claims**

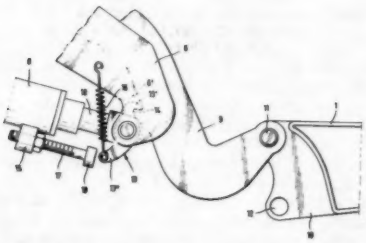
1. Cargo-transporter, particularly of the trailer type, comprising a loading floor including at a front thereof a first portion which is elevated, and a second portion situated directly behind the elevated first portion, said second portion including a section formed as a lifting platform having a lifting height corresponding to a difference in levels between said first and second portions, an apparatus for guiding and lifting said platform accommodated in a space below said platform, said transporter being self-supporting, said lifting platform being vertically movably guided and having a length substantially corresponding to the length of the elevated first loading floor portion, said guiding and lifting apparatus being accommodated in a cup-shaped housing secured against a bottom of the vehicle and having a height corresponding to the lifting height of the platform, said guiding and lifting apparatus comprising two linkage systems interconnected by transverse torsion means and adapted to lift said lifting platform so that said lifting platform is moved upward vertically without simultaneously moving in a forward direction, the lifting platform being provided at an end edge thereof remote from the elevated loading floor portion with a downwardly extending skirt which extends in a lowered position of the lifting platform up to a bottom of said housing.

4,898,510

LIFTING AND SWIVELING DEVICE FOR A LOADING TAILGATE OF A TRUCK

Günter Weber, Hauptplatz 23, Gattendorf (Burgenland, Österreich), Austria

Filed Jul. 26, 1988, Ser. No. 226,859
Int. Cl.[4] B60P 1/48
U.S. Cl. 414—557 **6 Claims**



1. A lifting and swivelling device for a tailgate of a truck, comprising:

(a) a structural support member, transversely attached to said truck, and having upper, middle and lower pivot points;

(b) a lifting arm with first and second ends, its first end being pivoted about said upper pivot point, and having a second pivot point in its second end;

(c) a pressure-means lifting cylinder with a first end pivoted about said lower pivot point, and a second end pivoted about said second pivot point at said second end of said lifting arm;

(d) an angled swivel arm having a first end and a bent second end, said angled swivel arm being pivoted at its first end about a third pivot point located on the half of said lifting arm nearest said upper pivot point, said angled swivel arm bearing on said lifting arm during a lifting process and being swivelable away from said lifting arm by said tailgate's weight when said tailgate is set on the ground, said angled swivel arm having a swivel arm pivot point at its bent second end;

(e) said tailgate having a top pivot point attached to said swivel arm pivot point, and having a bottom pivot point;

(f) a parallelogram connecting rod attached between said middle pivot point on said structural support member and said bottom pivot point on said tailgate, so that said upper, middle, bottom and top pivots points form the vertices of a parallelogram;

(g) a catch pivoted about said second pivot point at said second end of said lifting arm, said catch adapted to engage a projection on said angled swivel arm;

(h) resilient means attached between said catch and said lifting arm urging said catch to engage said projection; and

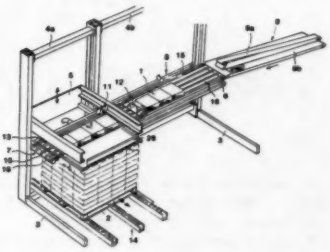
(i) an adjustment member on said pressure-means lifting cylinder, adapted to disengage said catch from said projection when said pressure-means lifting cylinder is fully retracted.

4,898,511

APPARATUS FOR STACKING PRODUCTS THAT ARE HIGHLY SUSCEPTIBLE TO DAMAGE, PARTICULARLY BOOKS

Manfred Rossig, Beckum, and Rolf Budde, Lohne, both of Fed. Rep. of Germany, assignors to Kolbus GmbH & Co. KG, Rahden, Fed. Rep. of Germany

PCT No. PCT/DE87/00180, § 371 Date Dec. 7, 1987, § 102(e) Date Dec. 7, 1987, PCT Pub. No. WO87/06565, PCT Pub. Date Nov. 5, 1987
PCT Filed Apr. 23, 1987, Ser. No. 141,310
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1986, 3614256
Int. Cl.[4] B65G 57/11
U.S. Cl. 414—792.6 **17 Claims**



1. Apparatus for stacking fragile products comprising:

feed system means, said feed system means comprising first support means for serially receiving the products to be stacked, said feed system means further comprising first stop means which cooperates with said first support means for arresting the movement of the products in a first direction, said first support means including transport means

and a first supporting surface, said transport means being movable relative to said first supporting surface to convey the products over said first supporting surface along a first path in said first direction to said first stop means whereby a row of the products extending from said first stop means may be formed, said first supporting surface being fluid permeable;

a sliding platform, said platform being positioned adjacent to said feed system means first support means and being reciprocally movable beneath said first supporting surface along a second path which is generally transverse to said first path, said sliding platform also being vertically movable relative to said first support means, said sliding platform having a second product supporting surface which is fluid permeable, said sliding platform further including second stop means for arresting movement of the products along said second path in said second direction;

means for pushing the products off said feed system means first supporting surface onto said sliding platform second supporting surface, said pushing means including a push-off element which is movable relative to said first and second supporting surfaces to urge the products into contact with said second stop means; and

means for delivering pressurized air to a region immediately below each of said first and second supporting surfaces whereby an air cushion for reducing friction between the products and the supporting surfaces is formed between said supporting surfaces and the products;

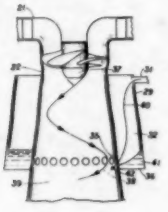
the permeability of the material comprising said supporting surfaces being chosen to be such that the pressure drop in an unladen portion thereof is at least equal to the pressure drop in a portion that is laden with the products.

4,898,512

APPARATUS AND METHOD FOR REDUCING EFFECTS OF DRAFT TUBE PRESSURE FLUCTUATIONS

Geffs, John J., 8841 Britland Way, Fair Oaks, Calif. 95628

Filed Mar. 27, 1989, Ser. No. 328,578
Int. Cl.[4] F03B *11/04, 3/10*
U.S. Cl. 415—1 **12 Claims**



1. Apparatus for reducing the effects of pressure fluctuations acting within a tube wherein a vortex has formed naturally during fluid flow through the tube comprising:

a closed surge suppression chamber having a bottom wall and a top wall mounted about the exterior of the tube having an opening leading into the upper end thereof adjacent the top wall;

a plurality of spaced apertures formed about the exterior of said tube fluidly communicating the interior of said tube with the interior of the surge suppression chamber adjacent to the bottom wall of said chamber; and

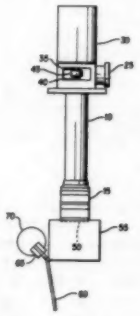
air injection means communicating with said opening for selectively injecting air therein from any angle.

4,898,513

CIRCULATING WATER SYSTEM AND SUMP PUMP STRAINER APPARATUS

Clarence C. Hon, Cherry Hill, N.J., assignor to Mobil Oil Corp., New York, N.Y.

Filed Jun. 5, 1989, Ser. No. 361,663
Int. Cl.[4] F04D *29/70*
U.S. Cl. 415—121.2 **12 Claims**



1. A centrifugal sump pump for withdrawing liquid from a reservoir comprising:

(a) a pump housing having motor mount means at an upper end;

(b) a pump intake conduit affixed to a lower end of said pump housing, said intake conduit having a fluid intake opening;

(c) a first perforate strainer covering said fluid intake opening;

(d) a second perforate strainer encasing said first perforate strainer, said second perforate strainer having finer perforations than said first perforate strainer and having open area at least equal to that of said first perforate strainer;

(e) a perforate door in said second perforate strainer hingeable attached to said second perforate strainer, said perforate door including means for retaining said perforate door closed during normal pump operation;

(f) lifting means attached to said perforate door for remotely opening said perforate door.

4,898,514

TURBINE BALANCE ARRANGEMENT WITH INTEGRAL AIR PASSAGE

James R. McCracken, Palm Beach Gardens, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Oct. 27, 1987, Ser. No. 112,857
Int. Cl.[4] F01D *5/10, 5/18*
U.S. Cl. 416—95 **10 Claims**

1. An apparatus for balancing a gas turbine rotor having a rotating disk and a plurality of air cooled blades extending from said disk and a supply of cooling air located on a first side of said disk comprising:

a plurality of axially extending dovetail slots through the outer edge of said disk;

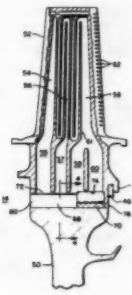
a mating dovetail on each of said blades, said dovetail shorter than the depth of said dovetail slots, thereby providing an axial opening through said dovetail slot;

said axial opening open at a first side of said disk in direct fluid communication with said supply of cooling air;

blocking means at a second side of said disk extending to the full depth of said dovetail slot whereby said axial opening is closed at the second side;

each blade having at least one cooling flow path therethrough including a radial inlet in fluid communication

with said axial opening; and a balance weight located in at least one of said axial openings filling less than all of said



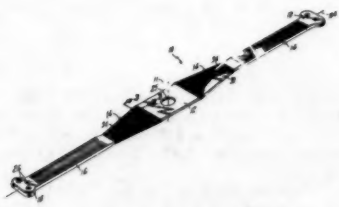
axial opening leaving a portion of the opening in fluid communication with said radial inlet.

4,898,515

EXTERNAL WRAP OF COMPOSITE FLEXBEAM

Edward A. Beno, Stratford, and William L. Noehren, Trumbull, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 23, 1986, Ser. No. 888,611
Int. Cl.[4] B64C *27/38*
U.S. Cl. 416—134 A **8 Claims**



1. A flexbeam (10) having a hub portion (12), a flap flexure portion (14) outboard of the hub portion, a lag-torsion flexure portion (16) outboard of the flap flexure portion, and a blade attachment portion (18) outboard of the lag-torsion portion, and having core fibers (32) of composite material extending longitudinally along the length of the flexbeam, characterized by:

an external wrap (34) made up of composite fibers (36) having an angular orientation with respect to the longitudinal flexbeam core fibers (32) and disposed about the flap flexure portion.

4,898,516

PROTECTIVE FAN SHIELD

Debra S. Hendricks, 666 E. Findlay St., Carey, Ohio 43316

Filed Feb. 16, 1989, Ser. No. 310,945
Int. Cl.[4] B63H *1/00*
U.S. Cl. 416—247 R **1 Claim**

1. A protective fan shield in combination with a rotary fan including rotating blades, said fan including a cage arranged about the blades and formed of coaxially spaced ribs, said shield comprising,

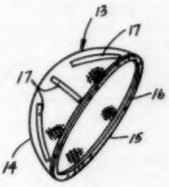
a flexible net member removably mounted about the cage, and

stiffening means secured to the net for preventing intrusion of said net between the ribs of a shield, and

wherein the stiffening means include a plurality of elongate flexible struts, and

wherein the stiffening means further include a plurality of pockets secured to an exterior surface of the net for receiving the struts selectively therewithin, and

wherein the shield is of a hemispherical configuration and formed with a continuous conduit about the perimeter



thereof with a continuous elastomeric band secured within the conduit, and

wherein the net is formed of woven fiberglass to define a mesh of 17 squares per square inch, and

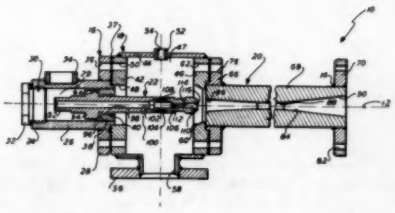
wherein the pockets are arcuate in configuration and are arranged orthogonally relative to the ribs of the cage when shield is secured about the cage.

4,898,517

STEAM/AIR EJECTOR FOR GENERATING A VACUUM

Olof A. Eriksen, 1 Saddle Rd., Cedar Knolls, N.J. 07927

Filed Oct. 21, 1988, Ser. No. 260,791
Int. Cl.[4] F04F *5/00*
U.S. Cl. 417—151 **2 Claims**



1. An ejector comprising:

a steam chest having an axis and having a coaxial steam chest cavity with an inlet opening;

a suction chamber connecting coaxially to the steam chest and having a coaxial suction chamber cavity with an inlet opening;

a diffuser coaxial with the steam chest and the suction chamber and having an elongate coaxial passage for exhausting the suction chamber cavity;

a nozzle unit extending through the steam chest cavity and the suction chamber cavity coaxially therewith;

said steam chest having an outside end wall and a peripheral wall and an inside end wall enclosing the steam chest cavity;

said outside end wall having an opening disposed coaxially with the nozzle unit; and

said opening having a removable cap for removing the nozzle unit and for replacing the nozzle unit or a duplicate thereof through the opening, wherein the nozzle unit has an enlarged portion having a bearing surface for engaging a bearing surface in the steam chest, and wherein the nozzle unit has an externally threaded portion for receival in an internally threaded hole in the steam chest, and wherein the nozzle unit has an elongate passage intercon-

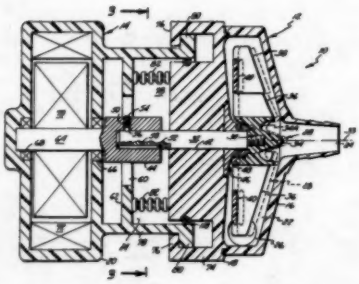
necting the steam chest cavity with the suction chest cavity with the suction chamber cavity, and wherein the nozzle unit has an end portion with an opening, and wherein the nozzle unit has a nozzle insert received in the end portion opening, said nozzle insert having a passage portion, said passage portion having an inlet portion and a necked down portion and an outlet portion, and wherein said steam chest inside wall and an adjacent end wall of the suction chamber have plurality of matching holes of the same angular spacing and overall diameter for a plurality of bolts and wherein said diffuser and said suction chamber have bare adjacent respective wall portions having plurality of matching holes of the same angular spacing and overall diameter for a plurality of bolts for facilitating joining of said steam chest inlet opening and suction chamber inlet opening to outside piping connections.

4,898,518

SHAFT DRIVEN DISPOSABLE CENTRIFUGAL PUMP

Lloyd C. Hubbard, Deephaven, and Earl W. Clausen, Eden Prarie, both of Minn., assignors to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed Aug. 31, 1988, Ser. No. 239,526
Int. Cl.[4] F04D *29/08, 29/60*
U.S. Cl. 417—360 **17 Claims**



1. In a centrifugal pump for pumping biological fluids of the type having a pumping portion and a separable drive portion with a rotatable drive shaft, the pumping portion having an impeller housing with a fluid pumping chamber therein, an impeller shaft extending rotatably through the impeller housing, an impeller mounted on the impeller shaft for rotation therewith in the pumping chamber and first seal means for providing a fluid-tight seal about the impeller shaft as it passes through the impeller housing, the improvement which comprises:

the impeller shaft being positioned and adapted to be mechanically engaged with the drive shaft of the drive portion for coupled rotation therewith when the pump and drive portions of the centrifugal pump are assembled; and

means for creating a fluid-tight sealed shaft chamber surrounding those portions of the impeller shaft outside the pumping chamber when the pump and drive portions of the centrifugal pump are assembled.

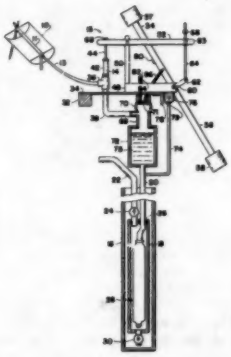
4,898,519

DEEP WELL SOLAR PUMP

Jaroslav Vanek, 414 Triphammer Rd., Ithaca, N.Y. 14850

Filed May 18, 1989, Ser. No. 354,465
Int. Cl.[4] F04B *17/00, 47/08*
U.S. Cl. 417—379 **9 Claims**

1. In a pump having a source of gas under pressure, and a gas operated pump, a mechanism periodically injecting gas from said source of gas into said gas operated pump, said mechanism comprising, in combination, a long period pendulum turning towards a first position by gravity, an injection valve connected between said source of gas under pressure and said gas operated pump, a linkage between said pendulum and said injection valve, said linkage opening said injection valve when said pendulum is in said first position, an impulse tube connected between said injection valve and said gas operated



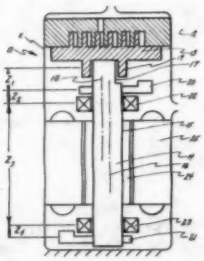
pump, a member having a surface adjacent to the first position of said pendulum, and an elastic impulse bladder connected to said impulse tube adjacent to said surface so that inflation of said impulse bladder on the opening of said injection valve forces said impulse bladder against said pendulum urging said pendulum against the force of gravity toward a second position.

4,898,520

METHOD OF AND ARRANGEMENT FOR REDUCING BEARING LOADS IN SCROLL COMPRESSORS

Jeffrey J. Nieter, Coventry, and Raymond L. DeBlois, Tolland, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 18, 1988, Ser. No. 220,719
Int. Cl.[4] F04C *18/04, 29/00*
U.S. Cl. 418—1 **5 Claims**



1. A scroll compressor comprising

a support:

a drive shaft having a main portion centered on an axis and an eccentric crank portion transversely offset from said axis; bearing means for supporting said main portion of said shaft on said support for rotation about said axis;

a fixed scroll element mounted on said support so as to be stationary relative thereto at least as far as rotation about said axis is concerned;

an orbiting scroll element mounted for orbiting motion relative to said fixed scroll element, bounding therewith at least one compression space, and acted upon by said crank portion of said drive shaft;

means for admitting a medium to be compressed into and for discharging said medium from said compression space;

means rotating said drive shaft about said axis for said crank portion to cause said orbiting scroll element to conduct said orbiting motion with said medium being compressed in said compression space prior to its discharge with attendant exertion of a resultant pressure force by said medium on said orbiting scroll element and transmission of such force to said crank portion of said drive shaft, and application to said drive shaft of inertial forces resulting from rotation around said axis of eccentric masses of said drive shaft and said orbiting scroll element; and

balancing means including at least two counterweights mounted on said drive shaft at mutually opposite sides of said bearing means for joint rotation with said drive shaft about said axis, each of said counterweights having such a mass and angular position about said axis that the counteracting inertial force exerted thereby on said drive shaft takes into account not only all of the inertial forces acting on said drive shaft but also pressure force for said counterweights to substantially compensate for the combined effect of all other eccentric masses and of said resultant pressure force on said bearing means at least when said drive shaft rotates at a predetermined speed.

4,898,521

OIL FEEDING SYSTEM FOR SCROLL COMPRESSOR

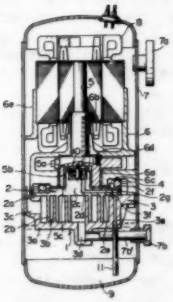
Kazuo Sakurai, Shizuoka, and Takahiro Tamura, Shimizu, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 3, 1988, Ser. No. 227,648

Claims priority, application Japan, Aug. 10, 1987, 62-198083

Int. Cl.[4] F04C *18/04, 29/02*

U.S. Cl. 418—55 **8 Claims**



1. An oil feeding system for a scroll compressor comprising: a scroll compressor section having a gyratory scroll and a stationary scroll each having a base and a spiral wrap provided normally on said base, said wraps being intertwined in such a manner that, when said gyratory scroll is caused to gyrate, a space defined by said wraps and said bases is reduced and said space moves toward a center so as to perform compression; a motor disposed at an upper position and said scroll compressor section being disposed at a lower position; a drive shaft means for connecting said motor to said compressor section; a frame provided with bearings for supporting said drive shaft means and disposed between said scroll compressor section and said motor so as to link and fix the compressor section and the motor in place; an enclosed vessel means for accomodating said scroll compressor section and said motor; a suction pipe opening into an interior of said enclosed vessel means; a suction port formed in an outer periphery of said stationary scroll and communicating with the interior of said enclosed vessel means; and a discharge port formed in said stationary scroll and communicating with a discharge pipe extending in such a manner so as to open to an exterior of said enclosed vessel means, the interior of said enclosed vessel means being adapted to maintain a low-pressure atmosphere,

said oil feeding system comprising:

a gyratory shaft projecting from a side of said base of said gyratory scroll opposite a side on which said wrap is provided; an eccentric hole including cavities formed in an end of said drive shaft means, said gyratory shaft being fitted into said eccentric hole for driving said gyratory scroll; a pump chamber means concentrically formed at an end of said gyratory shaft; a pump case having a circular-arc suction port formed on one side of said pump case and a circular-arc discharge-side oil sump formed on the other side of said pump case; a trochoid pump disposed within said pump chamber means together with said pump case; a cover disposed in such a manner so as to cover an upper portion of said pump chamber means and provided with a discharge port formed therethrough; an oil line means; and an oil reservoir provided at a bottom of said enclosed vessel means, wherein said circular-arc suction portion of said pump case communicates with said oil reservoir through said oil line means said circular-arc oil sump communicates with said trochoid pump, and said discharge port of said cover communicates with various parts to be lubricated through said cavities.

4,898,522

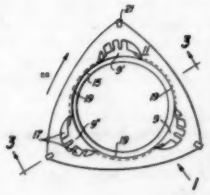
SYSTEM FOR COOLING THE ROTARY ENGINE ROTOR

Thomas C. Edelmayer, Mobile, Ala., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Apr. 7, 1988, Ser. No. 179,028

Int. Cl.[4] F01C *1/22, 21/06*

U.S. Cl. 418—61.2 **16 Claims**



1. A polygonal rotor for rotary engines comprising:

a generally equilateral, triangularly-shaped rotor body;

means for supporting a rotor bearing in said rotor body;

said rotor body having a central annular open portion of generally circular shape and off-axis semi-circular annular open portions provided substantially through each apex of said rotor body to act as a coolant passage;

said means for supporting a rotor bearing being fittable within said central annular open portion of said rotor;

said rotor being further provided with one or more coolant channels fluidly interconnecting said coolant passages to thereby allow the through passage of coolant therebetween;

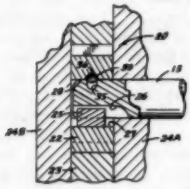
said coolant channels being defined between said means for supporting a rotor bearing and said central annular open portion of said rotor whereby coolant directly contacts said means for supporting a rotor bearing.

4,898,523

GEAR PUMP WITH RING-TYPE SHAFT RETAINER

Frank L. Harwath, Rockford, Ill., assignor to Suntec Industries Incorporated, Rockford, Ill.

Filed Dec. 27, 1988, Ser. No. 289,741
Int. Cl.[4] F01L *1/10*; F16D *1/06*
U.S. Cl. 418—70 **4 Claims**



1. A gear pump comprising a body, an elongated cylindrical shaft rotatably supported by said body and having an axially facing free end, a spur gear having a cylindrical hole receiving the free end portion of said shaft, radially opening keyways located in the free end portion of said shaft and in the wall of said hole, at least one of said keyways also opening axially, a key located in said keyways and preventing relative rotation between said shaft and said gear, and means for preventing relative axial movement between said shaft and said gear, said means comprising a first groove extending circumferentially around at least a portion of said shaft, a second groove extending circumferentially around at least a portion of the wall of said hole and alined axially with the groove in said shaft, and a ring-like retainer made of resiliently yieldable material, said retainer having an inner peripheral portion located in the groove in said shaft and having an outer peripheral portion located in the groove in the wall of said hole, said retainer being made of round wire having a predetermined cross-sectional diameter, the depth of the groove in said shaft being at least as great as the cross-sectional diameter of said wire whereby the retainer may be contracted resiliently and hoopwise into the groove in the shaft without the outer peripheral portion of the retainer projecting radially beyond the cylindrical surface of the shaft, the effective depth of the groove in the wall of said hole being less than the cross-sectional diameter of said wire whereby the latter groove captivates the inner peripheral portion of said retainer in the groove in said shaft when the retainer is expanded hoopwise, said retainer being radially split and having circumferentially facing ends which straddle said key, the transverse distance between the ends of said retainer being just slightly greater than the transverse width of said key when said retainer is fully contracted into the groove in said shaft.

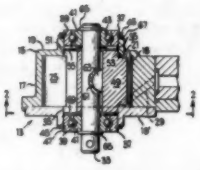
4,898,524

FLUID DRIVEN ROTARY MOTOR

James K. Butzen, Grayslake, Ill., assignor to Snap-on Tools Corporation, Kenosha, Wis.

Filed Jan. 27, 1989, Ser. No. 302,431
Int. Cl.[4] F01C *1/344, 19/08*
U.S. Cl. 418—136 **13 Claims**

1. In a fluid driven rotary motor of the type comprising:
a rotor housing which includes a rotor cover disposed between a pair of end plates;
the end plates each having a bore formed therein;
a rotor having a relatively large diameter, cylindrical working portion disposed between a pair of relatively small diameter, cylindrical end portions, the working portion defining a pair of axial faces,
a drive shaft which defines opposite ends and which is coaxial with the rotor and torsionally affixed thereto;
the rotor having a plurality of radially extending slots formed therein;
a plurality of vanes respectively slidably received in the slots;
two bearings each having an inner race and an outer race and being respectively mounted in the end plate bores so as to be radially supported therein;
the rotor and the drive shaft being rotatably mounted in the housing, the rotor end portions and the drive shaft ends being journaled in the end plate bores and the inner bearing races, respectively; and
the housing, the end plates, the rotor and the vanes cooperating with one another to define an plurality of variable, working volumes, whereby the introduction of a compressed fluid into the working volumes, its expansion therein and subsequent exhaust therefrom causes rotation of the rotor and the drive shaft;
the improvement comprising:
means for axially fixing the opposite ends of the drive shaft to the inner races;



the rotor being axially slidable with respect to the drive shaft;
an abutting ring having a hole formed therein and being intermediate one of said rotor end portions and the inner race of the bearing associated therewith so that said drive shaft is received in said hole;
said abutting ring abutting the inner race of the bearing associated therewith, and not contacting the outer race thereof;
axial compression spring means disposed between the other rotor end portion and the inner race of the bearing association therewith;
said axial compression spring means abutting the other rotor end portion and the inner race of the bearing associated therewith, and not contacting the outer race thereof; and
axial displacement of the rotor, with respect to the housing, being limited by said abutting ring and said axial compression spring means cooperating with the rotor end portions and the inner races of the bearings associated therewith, respectively, so that contact between on the working rotor portion and the end plates is avoided.

4,898,525

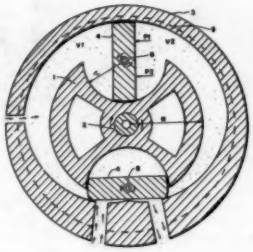
MOTOR, PUMP AND FLOW METER WITH A PLANETARY SYSTEM

Exarchou Hippocrates, Iroon Polytechniou I, Larisa, Greece

Filed Aug. 1, 1988, Ser. No. 227,005
Claims priority, application Greece, Apr. 27, 1988, 880100274
Int. Cl.[4] F01C *1/26*
U.S. Cl. 418—227 **8 Claims**

1. A planetary system (P.S) that can be used as pump, fluid flow meter and motor, comprising, in combination, a housing (3): a cylindrical core (1): means rotatably mounting said core in said housing, said core having at least one peripheral portion engaging one arcuate surface portion of the inner surface of said housing: the inner surface of said housing and a peripheral surface of said core conjointly defining inlet and outlet chambers extending in opposite angular directions from the arcuate surface portion: two discs (9) mounted on the two basements of the core: one or more planets (4) mounted on the two discs: means (as example four gears 11, 12, 13, 14 per planet) inter-

connecting said cylindrical core and said planets for rotation of said planets on said core, as the latter rotates about its axis, at an angular velocity which is half of the angular velocity of said core and direction of movement of said planets opposite to that of said core: the inner surface of said housing being formed as



the loci generated by arbitary points on the circumferences of said planets during rotation of said core: the peripheral contours of said planets having a configuration contact with the inner surface of said housing during rotation of said core: a fluid inlet port in communication with said inlet chamber: and a fluid outlet port in communication with said outlet chamber.

4,898,526

VANE PUMP WITH AXIAL INLET AND PERIPHERAL TANGENTIAL OUTLET

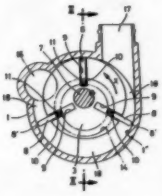
Hiroshi Sakamaki; Yukio Horikoshi, and Takeshi Jinnouchi, all of Sakado, Japan, assignors to Eagle Industry Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 78,422, Jul. 27, 1987, abandoned. This application Feb. 22, 1989, Ser. No. 314,296

Claims priority, application Japan, Aug. 12, 1986, 61-122850[U]

Int. Cl.[4] F04C *2/344*

U.S. Cl. 418—257 **2 Claims**



1. A vane pump comprising a pump housing means, said housing means having an internal cylindrical working chamber, a rotor means rotatably mounted in said working chamber, said working chamber having an inner peripheral wall and a cylindrical axis, said rotor means having an axis of rotation which is spaced from said cylindrical axis such that said rotor means is eccentrically mounted in said cylindrical working chamber, said housing means having two end sections and an intermediate section, said end sections being disposed at the longitudinal ends of said cylindrical working chamber, said intermediate section connecting said two end sections and being disposed radially outwardly of said working chamber, said end sections having bearing means for rotatably supporting said rotor means, said rotor means having a plurality of generally radial slots, vane elements slidably mounted in said slots such that as said rotor means rotates, said vane elements slide in and out of said slots to provide variable volume chambers between said vane elements which effect a pumping action, said variable volume chambers having an outer periphery defined by said inner peripheral wall of said cylindrical working chamber, said variable volume chambers having longitudinal ends defined by said two housing end sections, one of said housing end sections and said intermediate housing section having an axial inlet means which extends in an axial direction parallel to said cylindrical axis and which opens onto said working chambers, said axial inlet means extending the axial length of said intermediate housing section from said one housing end section to the other housing end section, said axial inlet means being spaced radially outwardly of the axis of rotation of said rotor means, said intermediate housing section having an outlet means which opens up onto said outer periphery of said working chambers such that the fluid being pumped is discharged through the outer periphery of the working chambers into said outlet means, said outlet means having an outlet passage which is tangentially disposed relative to said cylindrical chamber such that the fluid being pumped flows from said variable volume chambers tangentially into said tangential passage coincident with the inertia imparted to the fluid by the pump as said fluid exits said variable volume chambers.

4,898,527

APPARATUS FOR LIQUEFYING A THERMOPLASTIC HIGH POLYMER MATERIAL

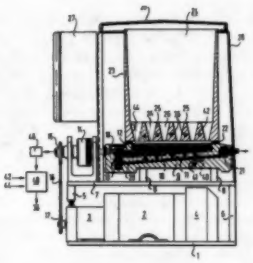
Henning J. Claassen, Industriegebiet Hafen, 2120 Lüneburg, Bundesrepublik Deutschland, Fed. Rep. of Germany

Filed Nov. 1, 1988, Ser. No. 265,438

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1987, 3738191

Int. Cl.[4] B29C *47/92*

U.S. Cl. 425—143 **5 Claims**



1. An apparatus for liquefying a thermoplastic high-polymer material, comprising:

(a) a supply container for the thermoplastic material;

(b) heating means for heating the thermoplastic material in the supply container;

(c) a base part arranged beneath the supply container and containing a collecting trough for the liquefied thermoplastic material;

(d) a sensor means for detecting the amount of liquefied thermoplastic high-polymer material conveyed out of the collecting trough and for supplying a corresponding signal as an actual value; and

(e) control means for controlling the heating means for the supply container relative to a result of a comparison between a given desired value of the amount of liquefied thermoplastic high-polymer material conveyed out of the collecting trough and an actual value detected by the sensor means.

4,898,528

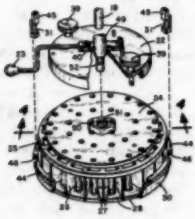
DIVIDING AND ROUNDING MACHINE

Mark L. Willard, Saginaw; David E. Beatty, Wrenshall, both of Minn., and Jeffery A. Nyquist, Superior, Wis., assignors to Dutchess Bakers' Machinery Company, Inc., Superior, Wis.

Filed Jul. 12, 1988, Ser. No. 217,657

Int. Cl.[4] A21C *3/10, 5/08*

U.S. Cl. 425—185 **1 Claim**



1. In a machine for dividing material such as dough or the like wherein the dough or the like is placed on a pallet supported by a crank plate which is movably mounted on a machine frame, and the machine frame includes an upstanding yoke section with an overhead support spaced above the crank plate, and a vertically movable rack connected to the overhead support, the rack having a lower yoke section attached thereto with said lower yoke section having downwardly extending arms, and a dividing assembly removably connected to said rack and downwardly extending arms, the improvement in rack, downwardly extending arms and dividing assembly comprising:

(a) said rack having a lower end formed into a cross key;

(b) said downwardly extending arms each having a ring groove proximate a lower end;

(c) said dividing assembly having an upper plate with a locking groove complementary sized to accept said cross key in one position and to engage and lock said cross key in another position of said dividing assembly;

(d) said dividing assembly further comprising an outer ring, said outer ring having a pair of ring slots which are alignable with said downwardly extending arms ring grooves, whereby said ring may be engaged and removed from said downwardly extending arms by aligning said ring slots and said ring grooves, and said ring may be attached to said downwardly extending arms by rotating said ring relative to said arms; and

(e) a trip plate attached to said lower yoke section above said dividing assembly, said trip plate having means for removably fastening to said dividing assembly, and having a pivotable lever engageable to said rack, said rack having a trip groove sized to receive said lever.

4,898,529

APPARATUS FOR MOLDING MAGNETO-OPTIC SUBSTRATES

Boris J. Muchnik, Boulder, Colo., and Bernd F. Fischer, Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 84,273, Aug. 11, 1987. This application Dec. 29, 1988, Ser. No. 291,839

Int. Cl.[4] B29C *45/74;* **B29D** *17/00*

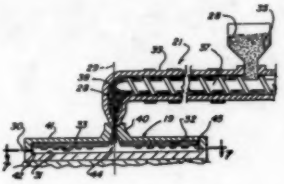
U.S. Cl. 425—542 **1 Claim**

1. In an injection molding apparatus for manufacturing a magneto-optic recording substrate; said substrate being planar, circularly symmetrical relative to an axis of symmetry, and having relatively uniform birefringence with respect to azimuthal position around said axis of symmetry; the improvement comprising:

a two-piece mold having a cavity therein for forming said substrate, said cavity being planar and having a center corresponding to said axis of symmetry, said cavity being continuous from said center to an outer circular perimeter;

support means for positioning said mold with the plane defined thereby horizontal and with said cavity closed for receiving hot fluid plastic material; and

a horizontally directed, heated barrel having rightangle



bend means for vertically injecting said hot fluid plastic material into said center of said mold so that said fluid plastic moves substantially horizontally, radially, relatively independent of the force of gravity, and uniformly through said mold so as to minimize birefringence variations of the substrate with respect to azimuthal position around said axis of symmetry.

4,898,530

METHOD OF OPERATING A PAIR OF BURNERS AND APPARATUS FOR USE IN THE METHOD

Brian Wills, Kinver, and Gary Johns, Wolverhampton, both of United Kingdom, assignors to Stordy Combustion Engineering Limited, Wolverhampton, United Kingdom

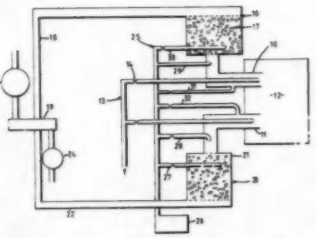
PCT No. PCT/GB87/00212, § 371 Date Jan. 14, 1988, § 102(e) Date Jan. 14, 1988, PCT Pub. No. WO87/05988, PCT Pub. Date Oct. 8, 1987

PCT Filed Mar. 27, 1987, Ser. No. 127,666

Claims priority, application United Kingdom, Mar. 27, 1986, 8607810

Int. Cl.[4] F23L *15/04*

U.S. Cl. 431—11 **3 Claims**



1. A method of operating a pair of burners cyclically wherein, during a first part of each cycle, air is passed through a first heat store to a first of the burners, fuel is discharged from the first burner with the air and burns in a combustion space, hot products of combustion are passed from the combustion space through a second heat store associated with the second burner and heat is transferred from the products of combustion to the second heat store, wherein during a second part of each cycle, air is passed through the second heat store, is heated therein, is discharged from the second burner with fuel into the combustion space to burn therein and the hot products of

combustion flow from the combustion space through the first burner and then through the first heat store to impart heat to the latter, wherein a reducing agent is introduced into the products of combustion at said first burner and wherein, before the products of combustion leave the first heat store, the reducing agent reduces oxides of nitrogen present in the products of combustion.

4,898,531

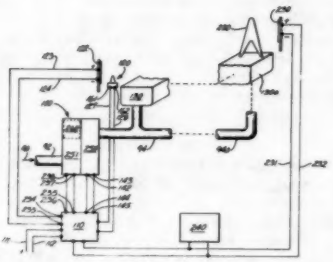
PHOTOSENSITIVE CONTROL OF ELECTRICALLY POWERED EMISSIVE IGNITION DEVICES

Mark K. Goldstein, La Jolla, and Earl M. Dolnick, Encinitas, both of Calif., assignors to Quantum Group, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 101,038, Jul. 3, 1984, Pat. No. 4,263,791, Ser. No. 659,074, Oct. 5, 1984, abandoned, Ser. No. 517,699, Jul. 25, 1983, abandoned, Ser. No. 693,869, Jan. 22, 1985, abandoned, Ser. No. 937,609, Dec. 3, 1986, abandoned, Ser. No. 701,369, Feb. 13, 1985, abandoned, and Ser. No. 48,961, May 11, 1987, Pat. No. 4,793,799. This application Aug. 1, 1988, Ser. No. 227,083

Int. Cl.[4] F23N *5/08*

U.S. Cl. 431—12 **19 Claims**



1. A method for controlling a gas burning appliance comprising the steps of:

passing current through an emissive igniter;

generating a current and voltage from a photovoltaic device viewing the igniter; and

opening a gas valve to a burner when the current and/or voltage from the photovoltaic detector exceed a threshold sufficient for opening the valve with no other source of electric power;

heating an emissive element with a flame from the burner; and

generating sufficient current and voltage from a second photovoltaic device viewing the emissive element for maintaining the valve open with no other source of electric power.

4,898,532

RETRACTABLE LIGHTER APPARATUS

David P. Bercik, 516 Elmira St., Menongahela, Pa. 15063

Filed May 22, 1989, Ser. No. 355,324

Int. Cl.[4] F23Q *2/32*

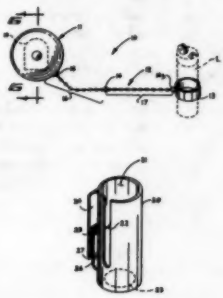
U.S. Cl. 431—253 **9 Claims**

1. A retractable lighter apparatus comprising, in combination,

a retraction member including a first tether line secured interiorly of the retraction member and biased interiorly of the retraction member in a first position and extensible exteriorly of the retraction member to a second extended position, and

a second tether line secured to said first tether line and including an abutment means for maintaining said second tether line exteriorly of said housing in said first and second positions, and

a clip member integrally secured to a terminal free end of



said second tether line to clampingly secure a lighter assembly therewithin, and

a pouch means for securement of said clip means and said lighter assembly in said first position.

4,898,533

FLUIDIZED-BED ACTIVATION FURNACE FOR ACTIVATED CARBON

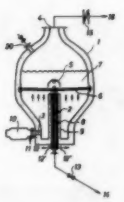
Tsuneo Okamoto, and Yasuo Sakaguchi, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 21, 1988, Ser. No. 274,168

Claims priority, application Japan, Nov. 25, 1987, 62-296660

Int. Cl.[4] F27B *15/00*

U.S. Cl. 432—58 **3 Claims**



1. A fluidized-bed activation furnace comprising:

a central hollow pillar vertically extending from a bottom portion of said fluidized-bed activation furnace to a central portion of said furnace and having an outlet for discharging activated carbon granules at an upper portion thereof;

a bowl-shaped cap covering a top portion of said central hollow pillar;

a perforated plate located under said bowl-shaped cap and fixed to an outer periphery of said central hollow pillar below said outlet for discharging activated carbon granules so as to divide said fluidized-bed activation furnace into two portions of an upper portion and a lower portion;

a steam jacket covering the outer periphery of said central hollow pillar and a fire resistant and heat insulating material covering the outer periphery of said steam jacket;

a cooling steam introducing system for introducing cooling steam, into said steam jacket; and

a high temperature activating gas introducing system which is provided at the lower portion of said furnace; and wherein

(a) said bowl-shaped cap has an inner diameter 1.2 to 3.0

times as large as an outer diameter of said central hollow pillar;

(b) a gap between a lower edge of said bowl-shaped cap and said perforated plate is 5 to 50 mm;

(c) said perforated plate is so designed that an opening ratio of an annular zone of said perforated plate between said central hollow pillar and an outer periphery of a circle which is concentric with a circular cross section of said central hollow pillar and has a diameter 1.2 to 1.5 times as large as the inner diameter of said bowl-shaped cap, is 1.2 to 3 times as large as an opening ratio of a zone of said perforated plate which is outside of said annular zone; and

(d) said perforated plate is fixed to the outer periphery of said central hollow pillar in such a manner as to have a downward inclination of 2° to 10° toward a fixed portion of said perforated plate.

4,898,534

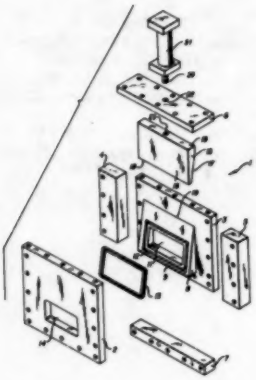
APPARATUS AND PROCESS FOR FIRING CERAMICS

Robert L. Huntt, Germantown, Md., assignor to Alpha Industries, Woburn, Mass.

Division of Ser. No. 149,174, Jan. 27, 1988, Pat. No. 4,833,302. This application Jan. 31, 1989, Ser. No. 304,292

Int. Cl.[4] F27D *1/18*; H05E *3/66*

U.S. Cl. 432—250 **3 Claims**



1. A door assembly for a high temperature oven or kiln, said door assembly including a door frame and a door vertically movable therein from an open position to a shut position and vice versa,

said door frame including a front plate, a back plate, side plates and top and bottom plates, said plates defining a cavity thereinbetween, one of said front and back plates extending in said cavity at least in part at an angle of at least 2° to the vertical, and the other plate being substantially vertical so that said cavity is at least in part wedge-shaped thereinbetween, aligned apertures in said front and rear plates defining an opening through which material can pass into or out of the high temperature oven or kiln, said cavity being wedge-shaped in the area surrounding at least one of said apertures, a resilient seal surrounding the aperture in the plate extending at said angle,

said door located generally within said cavity and having a front surface and a back surface, said surfaces being generally at the same angles respectively as said front plate and said back plate, said door movable vertically from an open position wherein the door is out of contact with said resilient seal and displaced from the area between the apertures to provide unimpeded passage therethrough, to a closed position wherein the wedge shape of the door and of the cavity cooperate to firmly seal the door against the resilient seal so that gases cannot substantially escape through the closed door.

4,898,535

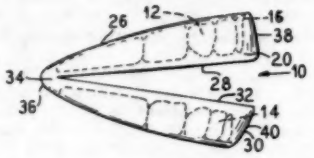
SELF-OPENING PREFORMED ACTIVATOR AND POSITIONER

Earl O. Bergersen, 950 Green Bay Rd., Winnetka, Ill. 60093

Filed Apr. 11, 1988, Ser. No. 180,178

Int. Cl.[4] A61C *7/00*

U.S. Cl. 433—6 **12 Claims**



1. An orthodontic appliance for use in the positioning of teeth which includes a first tooth receiving trough in an upper portion for positioning an upper row of teeth and a second tooth receiving trough in a lower portion for positioning a lower row of teeth, said troughs being defined by lingual and labial-buccal flanges and including an isthmus interconnecting said flanges, said upper portion isthmus and said lower portion isthmus being separated at an anterior end of said appliance, but connected at a posterior end of said appliance to form a hinge connection between said two portions.

4,898,536

DEVICE FOR DISPLAYING GRAPHIC INFORMATION

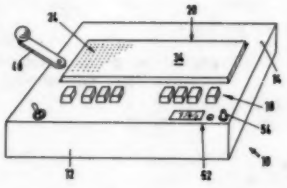
Rainer Hoffarth, Bellshauser Muhle 1, D-3555 Fronhausen, Fed. Rep. of Germany

Continuation of Ser. No. 936,431, Dec. 1, 1986, abandoned. This application Jun. 9, 1988, Ser. No. 204,259

Claims priority, application European Pat. Off., Dec. 11, 1985, 85115789

Int. Cl.[4] G09B *21/02*; B41J *3/32*

U.S. Cl. 434—114 **9 Claims**



1. A device (10) for tactually and visually displaying graphic information, such as braille texts, which device is composed of

(a) a flat display having a top face (34) that is formed by the tops of a plurality of profiles (30) arranged in side-by-side parallel relationship to each other, each of said profiles having at least one elongated row of spaced apart vertical bores (32),

(b) a pin (22) with a rounded upper tip (24) positioned within each of said bores (32), said bores (32) serving as guides for the vertical movement of said pins (22) in a direction perpendicular to top face (34),

(c) spring means (28) associated with the lower end of each pin (22) which bias each pin (22) to its lowermost position so that the rounded tip (24) does not extend above the top of its surrounding bore (32),

(d) stroke releasers (60) associated with each pin (22) which are electrically actuatable to allow each pin (22) to rise

from its lower spring biased position to a upper position where the rounded tip (24) of the pin (22) projects above said top face (34),

(e) locking means (26) to lock each pin (22) in said upper position,

(f) eraser means (36) for returning each pin (22) from its said upper position to its spring-biased lower position, and

(g) said locking means (26) and said eraser means for each elongated row of pins (22) comprising strip (34) that is mounted between said profiles (30) and beneath said top face (34) so as to be able to both engage and disengage the pins (22) in each elongated row of pins, each said strip (34) being movable with respect to its associated adjacent profile (30) in a direction parallel to said top face (34) and transverse to the longitudinal axes of said pins (22).

4,898,537

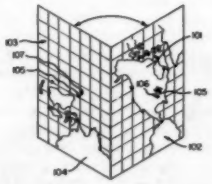
LOCATING SYSTEM FOR MAPS AND OTHER DIAGRAMS AND DISPLAYS

Paul L. Pryor, 10 Lonsdale Ave., Dayton, Ohio 45419

Filed Dec. 12, 1988, Ser. No. 283,100

Int. Cl.[4] G09B *19/00*

U.S. Cl. 434—130 **11 Claims**



1. In an instructional device for relating information on one surface to information on another surface, the improvement comprising:

means defining a pair of positionally related surfaces, said surfaces defining a first side, said first side having spatially related information thereon,

means defining a second side, said second side having information thereon spatially arranged to relate to specific portions of the information on said first side, and

marking means for engagement with locations on said first side corresponding to locations of said specific portions of information thereon for producing a mark on said second side at a location which is antipodal to the information on said first side.

4,898,538

SELF ALIGNING CONNECTOR

Michael F. Tratar, Mentor; Edwin L. Bremenour, Euclid, and Dale R. Terdan, Mentor, all of Ohio, assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Feb. 16, 1989, Ser. No. 310,951

Int. Cl.[4] H01R *13/629*

U.S. Cl. 439—76 **8 Claims**

1. A self aligning connector assembly comprising:

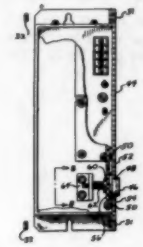
a first enclosure;

a first connector mounted to the first enclosure;

a guide plate including an alignment guide means affixed thereto and means which adjustably fasten the guide plate to the first enclosure so that the guide plate has a predetermined orientation with respect to the first connector;

a second enclosure including a receptacle for receiving the alignment guide means, and means for attaching the second enclosure to the guide plate; and

a second connector mounted to the second enclosure and engaging the first connector;



whereby the first and second connectors are aligned with each other by means of the guide plate.

4,898,539

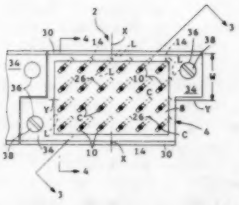
SURFACE MOUNT HDI CONTACT

Douglas W. Glover, Harrisburg, and Donald R. Harner, Camp Hill, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 22, 1989, Ser. No. 314,331

Int. Cl.[4] H01R *9/09, 13/24*

U.S. Cl. 439—81 **14 Claims**



1. A pin header electrical connector comprising;

an insulating housing having a flat interface surface and a mating face opposite thereto, said housing defining a multiplicity of contact element receiving, through cavities, each of which opens both into said interface surface and into said mating face; and

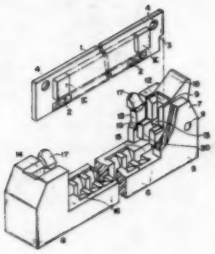
a one-piece electrical contact element retained in each of said cavities and having an elongate contact spring proximate to said interface surface, said contact spring having a longitudinal axis extending substantially parallel to that surface, a contact nose on said contact spring projecting from said interface surface and a contact pin projecting from said mating face, said contact noses being arranged in a gird array having X and Y axes extending normally of each other and intersecting said interface surface, said longitudinal axes of said contact springs, all extending parallel to each other but being angled with respect to both of said X and Y axes, and each contact pin presenting opposed, flat contact surfaces which are parallel to one of said X and Y axes and extend at right angles to the other of those axes.

4,898,540

CONNECTOR FOR A PRINTED CIRCUIT BOARD

Masaaki Saito, Tokyo, Japan, assignor to Yamaichi Electric Mfg. Co., Ltd., Tokyo, Japan

Filed Dec. 28, 1988, Ser. No. 291,299
Claims priority, application Japan, Dec. 28, 1987, 62-336265
Int. Cl.[4] H01R *13/62*
U.S. Cl. 439—153 **1 Claim**



1. A connector for a printed circuit board of the type having an inserting end, first and second corners at opposite sides of the inserting end, a cut-out portion at a first one of the first and second corners of the inserting end, a retaining hole at each of the first and second corners, and a plurality of contact points or conductor strips juxtaposed along a marginal portion of the inserting end, said connector comprising:

a connector body having first and second end portions, said connector body having a groove through which a printed circuit board is inserted and withdrawn;

a plurality of contacts disposed in said groove, said plurality of contacts being arranged for resiliently contacting a plurality of contact points or conductor strips on a printed circuit board received in said groove;

a resilient locking member attached to said connector body, said resilient locking member releasably engaging a first retaining hole at a first corner portion at the inserting end of a printed circut board when a printed circuit board is received in said groove in said connector body;

a single push-up lever pivotably attached to said connector body at said first end portion thereof, means on said single push-up lever for pushing up only one corner of a printed circuit board received in said groove in said connector body when said single push-up lever is pivoted, said means for pushing up only one corner of a printed circuit board including a push-up portion defined on said single push-up lever for engaging a cut-out portion at the first one of the first and second corners of the inserting end of a printed circuit board, and said single push-up lever further including disengaging means for simultaneously disengaging said locking member from a first retaining hole of a printed circuit board as said means for pushing up only one corner of a printed circuit board pushes up the one corner of the printed circuit board when said singel push-up lever is pivoted for releasing a printed circuit board received in said groove in said connector body; and

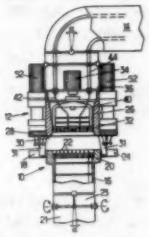
wherein, when said push-up lever is pivoted for releasing a printed circuit board, the printed circuit board is pivoted about the second corner thereof by the pushing up of only one corner of the printed circuit board by the single push-up lever.

4,898,541

MULTIPLE CONNECTION DEVICE

Christian Lhuillier, Clamart, France, assignor to Framatome, Courbevoie, France

Filed Sep. 30, 1988, Ser. No. 251,490
Claims priority, application France, Sep. 30, 1987, 87 13502
Int. Cl.[4] H01R *13/631*
U.S. Cl. 439—248 **8 Claims**



1. A self-alignment multiple connection device having two assemblies, one of which is movable in a direction towards and away from the other, wherein:

one of the assemblies has a first mechanical connection plate and a first connection element provided with contacts and fixed to the mechanical connection plate;

the other assembly includes a second mechanical connection plate and a second connection element provided with contacts arranged and distributed for operatively engaging the contacts of the first connection element upon movement of the latter along said direction toward the first plate, said second connection element being movable with respect to said second mechanical connection plate, along said direction; and

said second mechanical connection plate carries members arranged to engage the first plate and to achieve mutual centering of the two plates upon closing movement thereof along said direction, remotely controlled means for locking the plates one on the other in aligned and mutually abutting condition and drive means for moving said second connection element along said direction with respect to said second plate between a rear position in which the contacts of the first and second elements are separated from each other even when the plates are in abutting condition and a forward position in which the contacts of the two elements are in mutual engagement when the plates are in abutting condition.

4,898,542

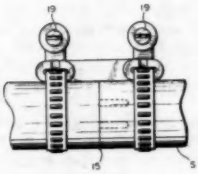
ANTI-SEPARATION COAXIAL CONNECTOR TIE-STRAPS

Frank A. Jones, Jr., Temple Hills, Md., assignor to Jerome J. Norris, Rockville, Md.

Filed Nov. 4, 1987, Ser. No. 116,359
Int. Cl.[4] H01R *13/639*
U.S. Cl. 439—371 **4 Claims**

1. A flexible tie-strap for securing a transporting structure joined together by coaxial connectors from separating comprising: dual elongated body portions having holding eyelets with apertures extending transversely therethrough at one end and strap portions having a flat side and a convex side at opposite ends, said convex side including a pair of spaced, parallel narrow ribs along a major portion of its length and said flat side including spaced parallel projections extending transversely thereof to provide a gripping surface, wherein said apertures are provided with rectangular slots aligned in communication therewith whereby the strap portions are passed through said holding eyelets apertures, and end portions of said strap free of the aperture are in registry with said slots after locking means

comprising a detent in the form of V-tooth rachets hold said straps in the holding eyelet against reverse movement; said straps having a bridging member connecting side portions of the upper areas of the elongated bodies and the eyelet projections.

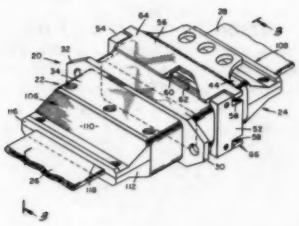


4,898,543

SELF-ALIGNING ELECTRICAL CONNECTOR

Everett L. Benze, Inglewood, Calif., assignor to G & H Technology, Inc., Santa Monica, Calif.

Filed Apr. 3, 1989, Ser. No. 332,035
Int. Cl.[4] H01R *13/62*
U.S. Cl. 439—374 **4 Claims**



1. An electrical connector having plug and receptacle parts which can be mated or unmated by force application directed along lines within a substantial angular range, comprising:

an open-ended hollow metal receptacle shell of generally rectangular cross-section with sidewalls forming the width being longer than those forming the height, and an inner edge portion surface being tapered;

a first insulative insert received within the receptacle shell having at least one slotlike opening therein, the plane of which is parallel to the sidewalls forming the receptacle shell width;

a first thin generally flat platelike contact received within the insert opening and extending parallel to the shell sidewalls forming the shell width;

an open-ended hollow metal plug shell of generally rectangular cross-section with sidewalls forming the width being longer than those forming the height, the cross-section dimensions of one end portion of said plug shell being capable of sliding receipt within an open end of the receptacle shell, an open end outer surface of said plug shell being positively radiused and provided with a groove spaced slightly from the radiused end that completely encircles the plug shell;

a second insulative insert received within the plug shell and having at least one slotlike opening therein with its plane parallel to the plug shell sidewalls forming the plug shell width; and

a second thin generally flat platelike contact complementary with the first contact, located within the plug insert opening and extending parallel to the plug shell sidewalls forming the plug shell width,

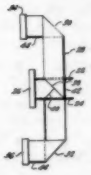
wherein when the first and second contacts are fully mated they lie in the same place.

4,898,544

FLAT CABLE SUPPORT COMB

Thomas Callahan, Wakefield, Mass., assignor to Thinking Machines Corporation, Cambridge, Mass.

Filed Mar. 23, 1988, Ser. No. 172,143
Int. Cl.[4] H01R *9/07*
U.S. Cl. 439—498 **6 Claims**



1. A printed circuit board interconnect system comprising:

a ribbon cable and terminal connectors for interconnecting first and second printed circuit boards located in separated racks and in substantially the same or parallel planes and having connectors at ends thereof with the same pin orientation;

said cable folded in a manner to interconnect said first and second printed circuit boards through the respective cable and board connectors with correct pin orientation with said cable as folded lying in substantially one plane;

the folded cable having first and second right angle folds adjacent the cable connectors and a central pair of right angle folds separated by a 180 degree fold in a central region of the cable, and said cable having a further 180 degree fold adjacent each right angle fold in the central region; and

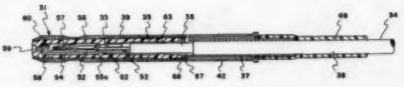
means for positioning said cable in said central region.

4,898,545

THIN-TYPE COAXIAL CONNECTOR AND RECEPTACLE FOR MATING WITH THE COAXIAL CONNECTORS

Hiroshi Endo; Takao Suzuki; Mitsuo Komoto; Kouzou Uekido, and Tetsuro Tokaichi, all of Tokyo, Japan, assignors to Japan Aviation Electronics Industry, Limited and NEC Corporation, both of, Japan

Filed Sep. 6, 1988, Ser. No. 240,943
Claims priority, application Japan, Sep. 9, 1987, 62-138727[U]; Oct. 9, 1987, 62-154828[U]; May 20, 1988, 63-65895[U]
Int. Cl.[4] H01R *17/18*
U.S. Cl. 439—578 **5 Claims**



1. A thin-type coaxial connector for use in an electrical and mechanical connection of an end of a coaxial cable which comprises a central conductor insulated from an outer conductor by an inner insulator, and an outer insulator jacket; said outer jacket and said inner insulator being cut away at said cable end to expose said central conductor, said inner insulator and said outer conductor as an exposed central conductor, an exposed inner insulator, and an exposed outer conductor, respectively; said coaxial connector comprising a central female

contact for making electrical and mechanical connections to said exposed central conductor, an insulator holder for holding said central female contact together with said exposed inner insulator; a ferrule for mounting on said outer jacket; said insulator holder and said ferrule being arranged adjacent to one another in an axial direction to have facing axial ends and being engaged with one another at the facing axial ends in order to prevent a relative rotation thereof; and an outer conductor sleeve fitted onto said insulator holder and said ferrule, said ferrule and said outer sleeve tightly clamping said exposed outer conductor therebetween, wherein:

said central female contact comprising a connecting portion shaped to be press-deformed to mechanically and electrically couple with said exposed central conductor and a contact portion connected to each other by a coupling portion, said contact portion comprising a cylindrical supporting portion connected said coupling portion; a receiving contact portion axially extending from said cylindrical supporting portion to a first extending end, said receiving contact portion having a generally arcuate lateral section and a V-shaped section at a position which is short of said first extending end, said V-shaped section providing an inner contact surface, a spring contact portion extending along said receiving contact portion from said cylindrical supporting portion with a gradually reducing gap therebetween and having a second extending end short of said first extending end, a ring-like member supported at said first extending end and defining an opening for receiving a pin contact, and an axial guide portion axially extending from said ring-like member along said receiving contact portion toward but short of said second extending end for guiding said pin contact inserted through said opening into said gap between said receiving and spring contact portions;

said insulator holder being formed in a discrete sleeve body and having radially inwardly projecting inner projections which come into a press contact with said central female contact and said exposed inner insulator, respectively;

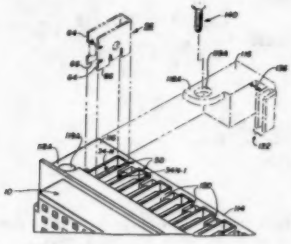
said outer conductive sleeve having a deforming portion for tightly clamping said exposed outer conductor with said ferrule after being press-deformed.

4,898,546

GROUND PLANE SHIELD DEVICE FOR RIGHT ANGLE CONNECTORS

Richard A. Elco, Mechanicsburg, and David F. Fusselman, Middletown, both of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 16, 1988, Ser. No. 285,461
Int. Cl.[4] H01R *13/648*
U.S. Cl. 439—608 **44 Claims**



1. A ground plane shield device for use with a connector mounted to a generally planar substrate, the connector being of the type having a housing from which a plurality of terminal tails emanate, the tails being arranged in at least one column, the tails each having a first portion generally perpendicular to the housing, a second portion generally perpendicular to the substrate, and an intermediate portion connecting the first and the second portions, the shield comprising:

a conducting member formed to define a first and a second panel arranged in generally confrontational spaced relationship with respect to each other, the panels defining a space therebetween, each panel having at least a first, connector, edge and a second, substrate, edge;

a first and second clip disposed on each panel in corresponding locations along the connector and the substrate edges, respectively,

the clip along the connector edge of each of the panels and the clip along the substrate edge of each of the panels extending toward the corresponding clip on the other of the panels thereby to place the corresponding clips into predetermined close proximity to each other,

each of the clips being arranged to receive and to grasp a predetermined portion of a predetermined one of the tails in the column of tails thereby to support the device above a substrate and to connect electrically the tails to the panel,

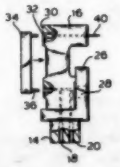
such that, in use, with the cutouts in the clips along the connector edges of the panels grasping the first portion of the predetermined one of the tails in the column and with the cutouts in the clips along the substrate edges of the panels grasping the substrate portion of the same predetermined tail the intermediate portion of all of the tails in the column is received in the space between the panels.

4,898,547

HYBRID INTERFACE ADAPTER

Stanley Bottoms, Largo, and James L. Korzik, Palm Harbor, both of Fla., assignors to Paradyne Corp., Largo, Fla.

Filed Jul. 30, 1985, Ser. No. 760,485
Int. Cl.[4] H01R *25/00*
U.S. Cl. 439—652 **4 Claims**



1. A hybrid interface adapter for coupling circuit lines carrying circuit signals of a first level to a bus having lines for carrying bus signals at a second level different from said first level comprising:

a body having a surface with first and second groups of holes;

a first port integrally secured to said body and having a third group of holes and a plurality of conductive elements for connecting each of said third group of holes to one of said second group of holes whereby said second group of holes may be coupled through said third group of holes to a bus by normal connection means;

a second port integrally secured to said body and having means for connecting the adapter to a PC board, said connecting means being electrically connected to said first group of holes; and

a signal level translating means removably connected to said first and second groups of holes, said signal level translating means being capable of being mounted in substantial abutment to said first and second groups of holes, said signal level translating means functioning to translate said circuit signals of a first level to said bus signals of a second level wherein said connecting means comprises a plurality of pins and wherein said plurality of pins are arranged perpendicularly to said third group of holes and wherein said third group of holes is arranged in two parallel rows,

the holes of one row being staggered with respect to the holes of the other row.

4,898,548

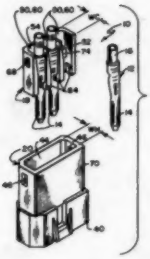
CONNECTOR ASSEMBLY

Arnold A. Case, West Chicago, and Robert DeRoss, Naperville, both of Ill., assignors to Molex Incorporated

Continuation of Ser. No. 778,476, Sep. 20, 1985. This application Jun. 17, 1987, Ser. No. 65,675

Int. Cl.[4] H01R *13/00*

U.S. Cl. 439—686 **2 Claims**



1. In a connector arrangement including a housing having a forward mating end with an opening and an opposed conductor receiving end with an opening having an insert receiving cavity extending therebetween, an insert telescopically received in said cavity, said insert including at least one channel adapted to receive a terminated wire lead, said channel cooperating with said housing to define a terminal-receiving passageway, a terminal received within said passageway including a forward mating end and a rear end, a conductor crimped in said rear end to form a terminated wire lead having a predetermined cross-sectional crimp height; mounting means for retaining said terminated lead in the channel; and means for releasably locking said insert within the housing;

the improvement comprising:

said insert including an upstanding projecting platform in said channel disposed intermediate the length of the channel having an upper surface adapted to support the rear end of the terminal, said platform cooperating with said housing to define a constricted region between the upper surface of the platform and the interior of the cavity, the cross section of said constricted region defining a maximum crimp height whereby only those terminated leads having a crimp height less than said maximum crimp height are receivable into the passageway.

4,898,549

CONNECTOR BUILT FROM ONE OR MORE SINGLE ROWED HOUSINGS, WITH LONG LASTING LOCKING MECHANISM

Katsuhiko Nakama, Nagaokakyo; Hiroshi Ninomiya, Uji; Toru Michishige, Nagaokakyo, and Fumiaki Itsuki, Ibaraki, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Continuation of Ser. No. 101,024, Sep. 24, 1987, abandoned, which is a division of Ser. No. 823,329, Jan. 28, 1986, Pat. No. 4,709,976. This application Feb. 28, 1989, Ser. No. 318,443

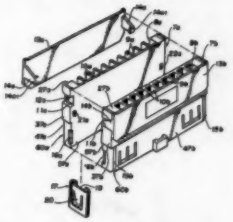
Int. Cl.[4] H01R *13/514*

U.S. Cl. 439—701 **4 Claims**

1. An electrical connector for coupling a plurality of wires to male terminals, comprising:

a first housing formed at one end thereof with a first single row of holes for receiving a plurality of male terminals and at another end and on a front surface thereof with a first single row of wire insertion depressions, each hole of said first single row of holes being in communication with a respective depression of said first single row of wire insertion depressions, said first housing including a first positioning means disposed on a rear surface thereof; and

a second housing identical to said first housing formed at one end thereof with a second single row of holes for respectively receiving a plurality of male terminals and at another end and on a front surface thereof with a second single row of wire insertion depressions, each hole of said second single row of holes being in communication with a



respective depression of said second single row of wire insertion depressions, said second housing including a second positioning means disposed on a rear surface thereof, wherein said said rear surfaces abut one another and are joined together through said first and second positioning means; and,

at least one coupling member separate from said housings for coupling said first and second housings together to form an integrated connector.

4,898,550

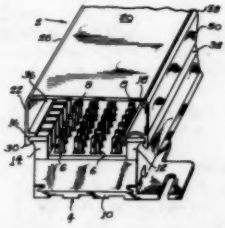
EXTRUDED PLASTIC HINGE COVER FOR TERMINAL BLOCKS

George E. Ayer, Naperville, Ill., assignor to Reliance Comm/Tec Corporation, Franklin Park, Ill.

Continuation of Ser. No. 139,001, Dec. 29, 1987, abandoned. This application Jul. 17, 1989, Ser. No. 382,003

Int. Cl.[4] H01R *9/00*

U.S. Cl. 439—718 **11 Claims**



1. A snap-on hinge cover for a communications terminal block comprising a plastic body having first, second, and third longitudinally extending sections, the second section being laterally intermediate the first and third sections, and joined thereto along boundary regions, said first and third sections having marginal regions spaced from said boundary regions, means at said marginal regions for snap-fitting and releasably locking said body onto opposed longitudinally spaced fanning strips of a communications terminal block, longitudinally extending hinge means along one side of said second section connecting adjacent marginal and boundary regions, said hinge means being formed as an extruded strip along with the extrusion of adjacent components of plastic of said body and with said body being of a predetermined rigidity, said components

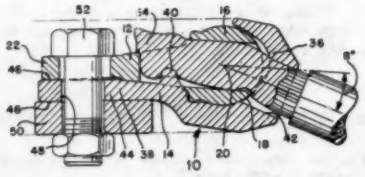
having spaced adjacent edges forming a gap and said hinge-forming extruded strip spanning said gap and having a resiliency which is high as compared to the resiliency of said first, second, and third sections and constituting a memory which biases the hinge portion of the cover to an open position upon release of the snap-fitting engagement of the marginal region and fanning strip remote from the hinge means and with maintenance of the snap-fitting engagement of the remote marginal region and fanning strip under spring pressure of the hinge means with the cover in closed position.

4,898,551

CABLE CLAMP

Paul A. Cornell, Knockamore, Ireland, assignor to Pan Electric Corporation, Carson City, Nebr.

Filed Apr. 11, 1989, Ser. No. 336,106
Int. Cl.[4] H01R *4/40*
U.S. Cl. 439—789 **22 Claims**



1. A cable clamp for terminating a cable, said connector comprising:

a male member having a generally cylindrical head and a first tail extending away from the head, said head defining a first cable receiving opening extending out of a cylindrical surface of the head, said first tail having two opposed first surfaces adjacent to a free end thereof;

a female member having a head receiving portion and a second tail, said head receiving portion receiving the head and shaped to permit rotation of the head, said head receiving portion defining a second cable receiving opening positioned to align with the first cable receiving opening when the male member is rotated to an open position with respect to the female member, said second tail having two opposed second surfaces at a free end thereof, one of said second surfaces acting as a mounting surface for the female member, the other of the second surfaces positioned to abut the adjacent one of the first surfaces;

said mounting surface defining a mounting plane, at least the majority of the male member situated above the mounting plane, a portion of the head receiving portion situated below the mounting plane to reduce the height of the female member above the mounting plane, said head receiving portion extending above the mounting plane by a distance greater than that by which it extends below the mounting plane;

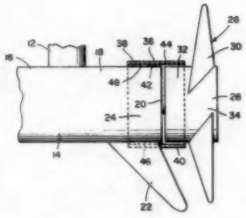
said first and second surfaces defining aligned apertures therethrough to receive a mounting fastener that clamps the first tail adjacent to the second ail and secures the mounting surface of the second tail against a support element.

4,898,552

OUTDRIVE LOWER UNIT HOUSING-TO-PROPELLER HUB BRIDGING SLEEVE

Ivan L. Cochran, Immokalee, Fla., assignor to Edward R. Olesky, Immokalee and Fred Tittle, Tavernier, both of, Fla., a part interest to each

Filed Oct. 20, 1988, Ser. No. 260,271
Int. Cl.[4] B63H *5/16*
U.S. Cl. 440—71 **4 Claims**



1. In combination with an outdrive lower unit including a horizontally elongated front-to-rear extending housing portion including remote first and second ends, one end of a propeller shaft journalled from said housing portion projecting endwise outwardly from said first end, a propeller including a hub portion having opposite axial ends, said hub portion being removably mounted on said one end of said propeller shaft closely adjacent said first end, said first end and the adjacent axial end of said hub portion being at least substantially cylindrical and of substantially the same outside diameter, a protective sleeve having a substantially constant inside diameter slightly greater than the outside diameters of said first end and said adjacent end of said hub and including first and second end portions, said first end portion being mounted on said first end of said housing portion with said second end portion projecting outwardly of said housing portion first end and closely and loosely telescoped over said adjacent axial end of said hub portion, spanning and enclosing the axial spacing between said housing portion first end and said adjacent axial end of said propeller hub portion and closely rotatably receiving said propeller hub portion adjacent axial end therein said sleeve first end portion being mounted on said housing portion first end solely through the use of an adhesive band layer at least substantially occupying the radial spacing between the inner surface of said sleeve first end portion and said housing portion first end.

4,898,553

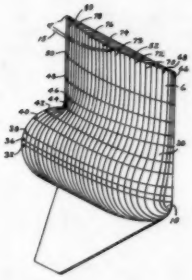
MARINE DRIVE UNIT WITH REDUCED DRAG

Herbert A. Bankstahl, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Apr. 11, 1988, Ser. No. 180,045
Int. Cl.[4] B63H *21/10*
U.S. Cl. 440—76 **8 Claims**

1. A marine drive comprising a lower drive unit near the transom of a boat and having a vertical depending strut portion with at least one vertical drive shaft and having a lower horizontal torpedo portion with at least one horizontal propeller shaft carrying at least one rear propeller, said strut portion and said torpedo portion having outer profiles which are blended along a blended portion such that vertical cross-sections through said strut portion, said blended portion and said torpedo portion have outer profiles defining an upper zone of substantially straight vertical outer surface elements, a central zone of concave outer surface profiles, and a lower zone of convex outer surface profiles, all as taken along said vertical cross-sections, and wherein the degree of concave curvature of said outer surface profiles of said central zone continually increases from the front of said blended portion to at least the

maximum width thereof such that the outer surface profiles along said vertical cross-sections of said blended portion are



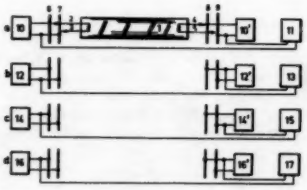
substantially less concavely curved at the front than at the maximum width thereof.

4,898,554

METHOD OF AND EQUIPMENT FOR AGEING A LOW-PRESSURE HOT-CATHODE DISCHARGE LIGHT SOURCE, PARTICULARLY A FLUORESCENT LAMP

Kálmán Antal; Béla Rimay, and Ferenc Halász, all of Budapest, Hungary, assignors to Tungsram Részvénytársaság, Budapest, Hungary

Filed Mar. 21, 1989, Ser. No. 326,802
Claims priority, application Hungary, Apr. 22, 1988, 2039/88
Int. Cl.[4] H01J *9/44*
U.S. Cl. 445—6 **14 Claims**



1. In a method of ageing a low-pressure hot-cathode gas discharge light source comprising the steps of

preheating two electrodes of a sealed gas discharge light source by connecting their input terminals to a supply unit forwarding electric preheating current,

generating a discharge arc between said preheated electrodes by applying voltage equal with or exceeding the burning voltage rating of said light source connected to said input terminals,

maintaning said discharge arc for a time selected to be in a predetermined period and

breaking said discharge arc after passing said time selected,

said generating, maintaning and breaking steps forming a cycle of operations,

repeating at least once said cycle and

checking selected operating parameters, the improvement of

applying in generating step increased alternating voltage being at least 8 times and at most 16 times higher than said burning voltage rating of said gas discharge light source,

maintaning said discharge arc for a short time and

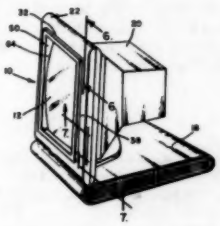
changing the connecting arrangement of said input terminals to said source of said increased alternating voltage each time before carrying out said repeating step, for accelerating the process of ageing.

4,898,555

DISPLAY SCREEN BEZEL AND ASSEMBLY METHOD

Craig F. Sampson, Palo Alto, Calif., assignor to Bell & Howell Publication Systems Company, Skokie, Ill.

Filed Mar. 23, 1989, Ser. No. 327,741
Int. Cl.[4] H04N *7/14, 5/64*; G08C *21/00*
U.S. Cl. 445—22 **42 Claims**



33. A method for assemblying a bezel to a display screen of a display device, comprising the steps of:

providing a display device having a display screen;

providing a chassis for mounting said display device thereto;

mounting said display device to said chassis;

providing a first bezel for the display screen, said first bezel having inner edges describing an opening in said first bezel;

providing a second bezel for being fitted within said first bezel opening, said second bezel having an inner lip with an edge describing an opening in said bezel, said inner lip edge conforming to the contour of said display screen for engaging said display screen, said second bezel including spring means carried thereby;

fitting said second bezel within said first bezel opening for being retained by said first bezel and with said spring means ,directed for resiliently engaging said first bezel; and

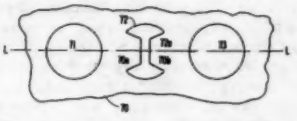
mounting said first bezel to said chassis with said second bezel fitted within said first bezel opening, and said second bezel's inner lip edge engaging said display screen and said spring means engaging said first bezel.

4,898,556

ELECTRON GUN INTEGRAL BEAM CORRECTORS AND METHOD

James C. Day, Owensboro, Ky., assignor to North American Philips Consumer Electronics Corp., New York, N.Y.

Continuation of Ser. No. 732,951, May 13, 1985, abandoned, which is a division of Ser. No. 518,507, Jul. 29, 1983, Pat. No. 4,584,500. This application Nov. 14, 1988, Ser. No. 274,694
Int. Cl.[4] H01J *29/02, 9/14*
U.S. Cl. 445—36 **3 Claims**



1. A method for producing an in-line electron gun electrode structure for a color cathode ray tube, such lensing structure having a planar surface normal to the in-line plane, and three in-line apertures having axes of symmetry lying in the in-line plane, each aperture having an opening in the planar surface, a terminal opening, a sidewall extending from the planar surface to define the terminal opening, and at least one pair of electron beam correctors extending from and integral with the sidewall

defining at least one of the terminal openings, the method comprising:

(a) producing three in-line holes in a workpiece of formable electrode material, at least one of the holes having a constricted central portion with substantially parallel sides; and

(b) forming the workpiece into a three-dimensional electrode structure in which predetermined portions of the material surrounding the holes is formed into aperture sidewalls whereby the aperture sidewall associated with the hole having the constricted central portion has integral extensions therefrom, which extensions function as beam correctors.

4,898,557

PROCESS FOR PREPARING EXTRACTION GRIDS

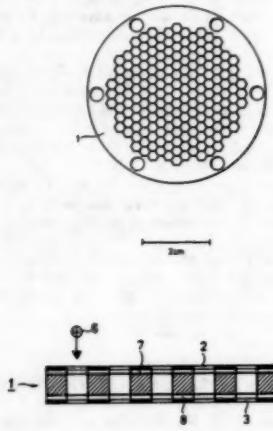
Jürgen Engemann, Wuppertal, Fed. Rep. of Germany, assignor to Leybold Aktiengesellschaft, Hanau, Fed. Rep. of Germany

Continuation of Ser. No. 881,634, Jul. 3, 1986, abandoned. This application May 6, 1988, Ser. No. 193,149

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1986, 3601632

Int. Cl.[4] H01J *09/24, 09/00*

U.S. Cl. 445—49 **11 Claims**



1. A process for producing extraction grids for ion sources comprising:

providing a mounting plate of a thermostable material selected from the group consisting of mineral insulating and semiconducting materials, on both sides with a continuous metal coating, and producing an essentially congruent pattern of holes symmetrical in size and shape extending through the mounting plate and the metal coatings, the step of producing an essentially congruent pattern of holes in the mounting plate and the metal coatings comprising providing the mounting plate with a pattern of holes having links therebetween while leaving the links unchanged, and subsequently providing the links on both sides with continuous metal coatings while keeping the holes open, the area of the coating covering substantially the entire area of the pattern the metal coatings coinciding on both sides of the mounting plate with the mounting plate extending fully to the edges of the metal coatings at the holes and with the holes of the mounting plate being free of overhang by either of the metal coatings.

4,898,558

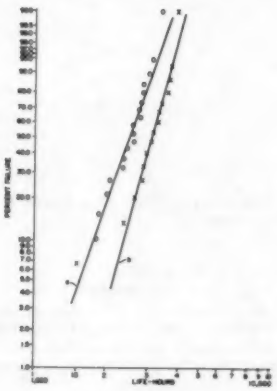
GETTER FOR INCANDESCENT LAMPS

John W. Shaffer, Montoursville, Pa., assignor to GTE Products Corporation, Danvers, Mass.

Continuation of Ser. No. 287,574, Dec. 16, 1988, abandoned, which is a continuation of Ser. No. 153,863, Feb. 9, 1988, abandoned. This application May 26, 1989, Ser. No. 358,520

Int. Cl.[4] H01J *9/38*

U.S. Cl. 445—53 **9 Claims**



1. A method of gettering an incandescent lamp comprising the steps of:

introducing a fill gas and a getter compound selected from the group consisting of silane compounds of the formula:

$$Si_aH_{(2a+2)}$$

wherein "a" is an integer greater than zero, a partially halogenated derivative thereof and mixtures thereof, into an unsealed lamp envelope; sealing the lamp envelope; and heating the sealed envelope, for a sufficient period of time, and at a sufficient temperature, to activate the getter before the decomposition of the getter.

4,898,559

MACHINES FOR THE IMPLANTATION OF CATHODES IN CATHODE-RAY TUBE GUNS

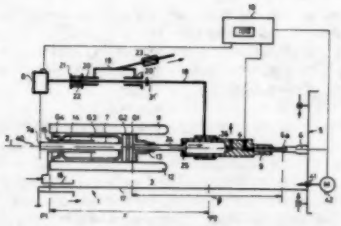
Daniel Cote, Ampuis Condrieu, France, assignor to Videocolor, Montrouge, France

Filed Jan. 10, 1989, Ser. No. 295,388

Claims priority, application France, Jan. 13, 1988, 88 00295

Int. Cl.[4] H01J *9/06*

U.S. Cl. 445—64 **8 Claims**



1. A machine for the implanting of a cathode in a caathode-

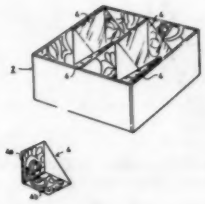
ray tube gun eyelet, of a type comprising a device to support the gun, movable along the axis of the gun, a cathode-supporting device positioning the cathode in the axis of the gun and a sensor with a retractable rod, working together with a first detector giving the position of the cathode when the rod is supported on the grid G1, said sensor being movable perpendicularly to the axis of the gun, said machine further comprising a gauge rod, with a calibrated length, which rests on the grid G2 and opens out on the side opposite to the eyelet, with a second detector recording the position of the gauge rod and a control device, determining the shift of the gun-supporting device through the measurements made by the two detectors.

4,898,560

MIRROR PATTERN FORMING AMUSEMENT DEVICE

Ivan Moscovich, 19 Elkachi Street, Afeka, Ramat Aviv, Israel

Filed Feb. 9, 1989, Ser. No. 308,155
Int. Cl.[4] A63H *33/04, 33/22*
U.S. Cl. 446—85 **16 Claims**



1. An amusement device comprising:

a plurality of mirror blocks of the same size and configuration, each of the blocks having a flat face for permitting the block to rest on a flat horizontal surface, and a mirror face a to face upwardly when the block is supported on said flat horizontal supporting surface;

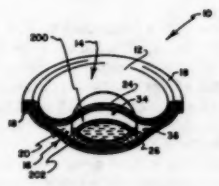
and a plurality of pattern-bearing elements each bearing a partial section of an overall pattern and selectively positionable with respect to the mirror faces of said blocks to reconstruct the overall pattern by reflections from the mirror faces of the mirror blocks.

4,898,561

SELF-INFLATING TOY

John R. Nottingham, 60 Stonewood Dr., and John Spirk, 50 Stonewood Dr., both of Moreland Hills, Ohio 44022

Continuation of Ser. No. 103,025, Sep. 30, 1987, abandoned, which is a continuation of Ser. No. 879,915, Jun. 27, 1986, abandoned. This application Mar. 27, 1989, Ser. No. 331,081
Int. Cl.[4] A63H *33/00*
U.S. Cl. 446—220 **10 Claims**



1. A hollow self-inflatable amusement device comprising,

a sealed hollow structure for flexible material which when inflated defines a substantially ball-like configuration,

said structure being formed from a pair of superposed sheets of said flexible material, said sheets being free of apertures or access openings over the surfaces thereof,

said sheets having a peripheral bonded seam joining the sheets together, with each sheet having excess material lying in non-planar relation within the seam periphery when said structure is in a non-inflated and generally collapsed state,

said excess material of said superposed bonded sheets in said non-inflates state including opposed outwardly convex generally part-spherical surfaces within the perimeter of said peripheral seam, thereby together with said peripheral seam defining a configuration which is substantially self-sustaining for ready handling and manipulation prior to impact and inflation,

normally inactive gas-generating means including a rupturable container containing a gas-generating chemical received within said hollow structure between said sheets,

said gas-generating means being responsive to impact pressure forces against the surfaces of said sheets to rupture said container and cause generation of a gas by said gas-generating means within said hollow structure to inflate the same,

said sheets and said gas-generating means cooperating to preclude rupture of said sheets under said impact forces thereby to maintain the integrity of said sealed hollow structure,

said gas-generating means controllably generating said gas following impact over a period from about 15 seconds to 2 minutes, thereby slowly inflating said hollow structure from the initial configuration thereof including said excess material inwardly of the sheet periphery to a final inflated form of generally ball-like appearance with a taut, generally smooth and unfolded surface, thereby permitting protracted observation thereof during inflation for amusement and interest, and,

said flexible material being substantially impervious to rapid leakage transmission of said gas therethrough, thereby to maintain the inflated configuration for a substantial period of time for observation, handling and enjoyment.

4,898,562

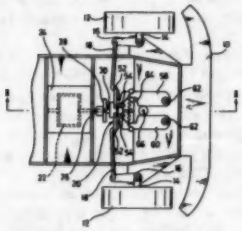
DIRECTION-COVERTING DEVICE FOR A REMOTE-CONTROLLED TOY

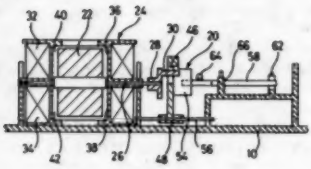
Zenichi Ishimoto, Tokyo, Japan, assignor to Nikko Co., Ltd., Tokyo, Japan

Filed Jul. 19, 1988, Ser. No. 221,467
Claims priority, application Japan, Sep. 12, 1987, 62-227559
Int. Cl.[4] A63H *17/385*
U.S. Cl. 446—460 **3 Claims**

1. A direction-shifting device for a remote-controlled toy, said device comprising a rotor shaft supported between opposite contact faces of opposing coil bobbins of an equally-divided electromagnetic coil, each said bobbin comprising a coil wound in multiple turns parallel to said rotor shaft, said rotor shaft supporting a rotor magnet, each said bobbin including a hollow interior within which is located a portion of said rotor magnet, an end of said rotor shaft being connected to a crank having an eccentric shaft, and direction-shifting means engaged with said eccentric shaft of said crank, said direction-shifting means being pivotably supported and displaceable by

said eccentric shaft in a lateral direction and connected at lateral portions thereof with opposing steering rods to accomplish a desired shift in direction upon displacement of said direction-shifting means.



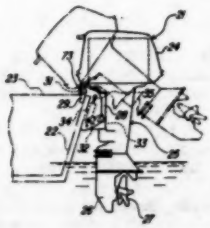


4,898,563

TRIM APPARATUS FOR MARINE PROPULSION UNIT

Katsumi Torigai, and Masanori Takahashi, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jun. 5, 1987, Ser. No. 58,908
Claims priority, application Japan, Jun. 6, 1986, 61-130045
Int. Cl.[4] B63H *21/26*
U.S. Cl. 440—1 **6 Claims**



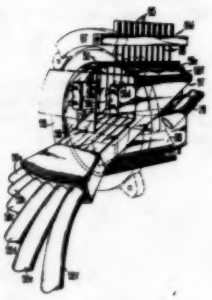
1. In a marine propulsion unit comprising an outboard drive adapted to be supported by a transom of a watercraft for movement between a plurality of trim adjusted positions, power means for moving said outboard drive between said positions, a throttle control for controlling a running speed of said watercraft, and means for operating said power means upon movement of said throttle control to a predetermined position for adjusting the trim of said outboard drive.

4,898,564

APPARATUS FOR COIN SORTING AND COUNTING

William L. Gunn, Atlanta; William D. Heath, Jr., Breman, and John C. Mantovani, Lilburn, all of Ga., assignors to Brink's Incorporated, Darien, Conn.

Division of Ser. No. 232,898, Aug. 16, 1988. This application Jun. 30, 1989, Ser. No. 374,187
Int. Cl.[4] G07D *3/00*
U.S. Cl. 453—3 **6 Claims**



1. In a coin handling apparatus of the type including a rotating cylindrical drum characterized by an axis of rotation and having a plurality of counterbores disposed in a plurality of channels lying in planes perpendicular to said axis of rotation, each of said counterbores having a hole therein, a cylindrical housing surrounding said rotating cylindrical drum to form a plenum between the inner surface of said rotating cylindrical drum and said cylindrical housing, means for creating a partial vacuum with said plenum such that the air pressure within said rotating cylinder is higher than the air pressure at the outer surface of said rotating cylinder, means for rotating said cylindrical drum within said cylindrical housing in a predetermined direction of rotation; the improvement comprising in combination:

an array of coin sensors disposed on said cylindrical housing such that at least one of said coin sensors is located over each one of said channels;

a plurality of elongated coin receiving stations located within said cylindrical drum each of said elongated coin receiving stations having a substantially rectangular opening at the top thereof extending lengthwise across said plurality of channels along lines parallel to said axis of rotation;

an array of selectively operable air valves disposed on said cylindrical housing such that at least one of said air valves is located substantially over said rectangular opening in each of said coin receiving stations for each of said channels;

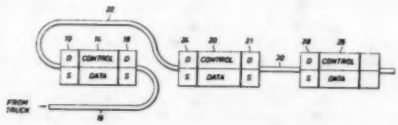
coin identification means connected to said array of coin sensors for providing a particular coin identification signal from a plurality of coin identification signals in response to each occurrence of a metallic object lodged in one of said counterbores of a particular one of said channels passing the one of said coin sensors located over said particular one of said channels; and

a controller connected to said array of air valves and said coin identification means for providing an activation signal to a particular one of said air valves located over said particular one of said channels in response to said particular coin identification signal to cause said metallic object to be ejected into a corresponding particular one of said coin receiving stations.

4,898,565
DIRECTION SENSING APPARATUS FOR DATA TRANSMISSION CABLE CONNECTIONS

Steve W. Braun, San Diego, Calif., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 428,009, Sep. 29, 1982, abandoned. This application Nov. 5, 1984, Ser. No. 668,679
Int. Cl.[4] H04B 9/00
U.S. Cl. 455—612 10 Claims

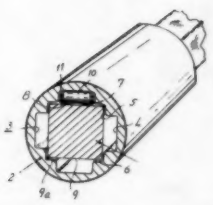


1. A data transmission apparatus including:
a data cable comprising a plurality of segments terminated with universal connectors,
a master station having a mating connector for connection to a connector of a first of said cable segments, and
a plurality of data stations, each having two data station universal connectors, each of said connectors being suitable for mating with one of said cable segment connectors for respectively connecting said data stations along said data cable,
direction sensing apparatus, comprising
a light source included in the connector of said master station,
a light source and a light detector included in each of said two data station connectors of each of said data stations,
fiberoptic means included in each of said cable segments to provide a light path for light from said master station light source to a light detector of a first data station connector and subsequent light paths to subsequent sequentially remote data stations from said first data station,
said light detector in a first of said data station connectors of said first data station connected to said fiberoptic means to detect light from said master station light source, said first data station including logic means operated by said light detector in said first of said data station connectors for establishing separate paths for control and data signals, respectively, through said first data station and for enabling a light source in the second of said data station connectors of said first data station, said path for said control signals being between said light detector in said first of said data station connectors and said light source in said second of said data station connectors, and said path for said data signals being between said light detector in said second of said data station connectors and said light source in said first of said data station connectors,
said light detector in the first of said data station connectors in each sequentially subsequent data station connected to said fiberoptic means to detect light sources from respectively preceding data stations, each of said subsequent data stations including logic means operated by said light detector in said respective subsequent data station, for detecting a light source from respectively preceding data stations for establishing separate paths for control and data signals, respectively, through each of said subsequent data stations and enabling said light sources in the second of said data station connectors of each of said respective subsequent data stations and
wherein said separate paths through each of said data stations are set concurrently and; the simultaneous, bidirectional transmission of said control and said data signals through each of said data stations can occur.

4,898,566
OVERLOAD-PROTECTED TORQUE TRANSMITTING TELESCOPIC SHAFT

Olle Hakansson, Eskilstuna, Sweden, assignor to FFV Autotech Aktiebolag, Eskilstuna, Sweden

Filed Jan. 20, 1988, Ser. No. 146,207
Claims priority, application Sweden, Mar. 12, 1987, 8701041
Int. Cl.[4] F16C 3/03
U.S. Cl. 464—167 9 Claims



1. A torque transmitting apparatus comprising a first element (2) and a second element (1) telescopically connected to rotate in common and axially translate relative to each other for play-free axial translation and torque transmission therebetween, said first element (2) including a bore having a polygonal cross-section defined by inner surfaces, said second member (1) having a polygonal cross-section defined by outer surfaces, each of said outer surfaces and an associated one of said inner surfaces forming a pair of cooperating surfaces, one of said cooperating surfaces of each pair having at least three sections including a central section defining a groove (4) narrower than the other of the cooperating surfaces and outer sections (5, 6) which cooperate with matching outer sections (9a) of said other of said cooperating surfaces (9), and rolling element means for supporting said second element (1) within said bore defined by said first element (2) for play-free axial movement relative to said first element (2) and play-free transmission of torque of predetermined magnitude between said first element (2) and said second element (1) and including a plurality of rolling element assemblies, each rolling element assembly being disposed between an associated pair of cooperating surfaces and partially disposed within said groove (4) associated therewith, said rolling element assembly including at least one bed (7), means (12) for restraining said bed (7) against axial movement relative to one of said elements comprising said first element (2) and said second element (1), a plurality of rolling elements (10 or 13) disposed between and in rolling contact with said one bed (7) and one of said cooperating surfaces of said associated pair, and spring biasing means (8) acting between the other of said cooperating surfaces of said associated pair and said bed (7) for biasing said bed (7) toward said one cooperating surface of said associated pair, said spring biasing means (8) having a spring force calculated to transmit torque up to a predetermined magnitude through said rolling element assembly from one of said elements comprising said first and second elements (2, 1) to the other of said elements comprising said first and second elements (2, 1) said outer sections (5, 6) being forced into direct contact with said matching outer sections (9a) by torque applied between said elements in excess of said perdetermined magnitude whereby said rolling element assemblies are protected from overloading.

4,898,567

PULLEYS FOR BELT-AND-PULLEY TYPE CONTINUOUSLY VARIABLE TRANSMISSION

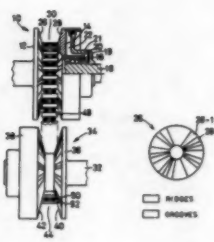
Yudai Tatara, Susono; Kiyoomi Sato, Toyota; Susumu Okawa, Aichi, and Yasunobu Jufuku, Gotenba, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Oct. 24, 1988, Ser. No. 261,319

Claims priority, application Japan, Oct. 26, 1987, 62-268059; Sep. 13, 1988, 63-229187

Int. Cl.[4] F16G *1/22*

U.S. Cl. 474—174 **13 Claims**



1. A pair of pulleys for a belt-and-pulley type continuously variable transmission wherein the pulleys are connected by a transmission belt having multiplicity of contact members such that the contact members of the belt are in contact with contact surfaces of the pulleys, wherein an improvement comprises:

at least one of said pair of pulleys has a contact surface which has a plurality of raised and recessed portions that are spaced apart from each other at irregular angular intervals in a circumferential direction of said at least one pulley such that said contact members of said belt abut on said contact surface of said at least one pulley at varying circumferential positions of said contact surface, so that a pitched noise due to abutting contact between said contact members and said contact surface is reduced.

4,898,568

ENDLESS TRANSMISSION BELT

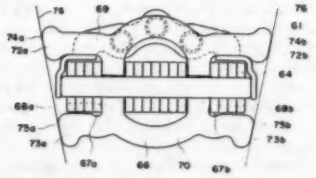
Shiro Sakakibara, Aichi; Yoshiaki Kano, Gifu, and Yoshinori Miyaishi, Aichi, all of Japan, assignors to Aisin Aw Kabushiki Kaisha, Japan

Filed Dec. 21, 1988, Ser. No. 287,323

Claims priority, application Japan, Dec. 29, 1987, 62-335988

Int. Cl.[4] F16G *1/24*

U.S. Cl. 474—245 **3 Claims**



1. An endless transmission belt including blocks and pins spaced along its length, link plates arranged in sets of parallel members, each of said link plates having a single opening formed therein, plural sets of said link plates being interconnected by said pins in an endless manner, each of said link plates comprising:

(a) upper and lower horizontal portions and side end faces defining a central opening, said horizontal portions joining said side end faces via rounded portions for contacting said pins;

(b) a first notch formed in the upper horizontal portion and partially defining said opening; and

(c) a second notch formed in the lower horizontal portion and partially defining said opening,

whereby stress received by said rounded portions at the top and the bottom of the side end faces is dispersed.

4,898,569

PROCESS, WEB OF MATERIAL AND APPARATUS FOR PRODUCING PACKAGING BLANKS

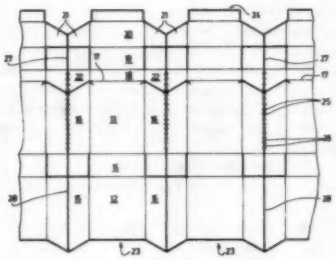
Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co. (GmbH & Co.), Fed. Rep. of Germany

Filed Apr. 21, 1988, Ser. No. 184,640

Claims priority, application Fed. Rep. of Germany, May 20, 1987, 3716897

Int. Cl.[4] B31B *1/18, 1/04*

U.S. Cl. 493—361 **6 Claims**



1. Process for producing, from thin cardboard, packaging blanks for the manufacture of hinge-lid packs and for delivering the blanks to a packaging machine, the blanks being formed as a result of punching of the cardboard, said process comprising the steps of:

forming in a continuous longitudinal cardboard web (24) a succession of blanks (23) connected to one another along their longitudinal edges which extend transverse to the longitudinal dimension of the web;

completely severing the connected blanks from one another along only a first edge region of the longitudinal edges;

punching in the web residual connections (25), in the form of perforations, in only a remaining edge region (29) of the longitudinal edges which is located in a middle region of the web of material

selecting the remaining edge region as a folding tab edge region which, after separation of a blank from the web, is concealed within a finished hinge-lid pack; and

then, delivering the thin cardboard web, having the residual connections between successive blanks, to a packaging machine where said separation occurs.

4,898,570

METHOD AND APPARATUS FOR HALF FOLDING PAPER SHEETS

Harry E. Luperti, Bethel; Robert Irvine, Riverside, and Anthony Luvara, Stamford, all of, assignors to Pitney Bowes, Stamford, Conn.

Continuation of Ser. No. 95,695, Sep. 19, 1987, abandoned. This application Feb. 8, 1989, Ser. No. 309,022

Int. Cl.[4] B65H *45/14, 45/24*

U.S. Cl. 493—420 **8 Claims**

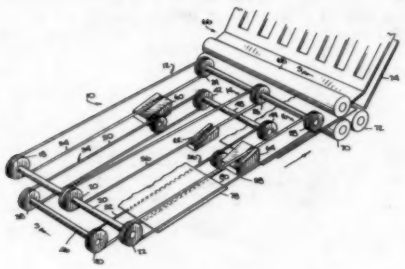
1. Apparatus for half folding sequentially and nesting a plurality of paper sheets, comprising:

a buckle chute folder having a pair of feed rollers rotating at

a given velocity, said rollers forming an entrance nip to said buckle chute folder;

means for feeding said plurality of paper sheets seriatim along a path toward said feed rollers at a second velocity greater than said given velocity; and

means situated within said path for causing a succeeding



paper sheet of said plurality to become shingled relative to a preceding paper sheet of said plurality prior to said succeeding paper sheet entering the nip of said feed rollers, thereby forming a shingled stream entering said entrance nip to said buckle chute folder, whereby any desired number of said sheets may be folded in half and nested one inside the other sequentially.

4,898,571

SOLID BOWL CENTRIFUGE

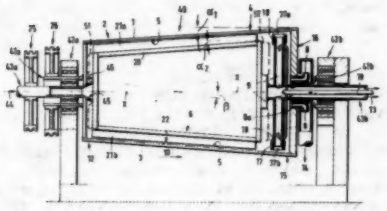
Wolfgang Epper, Bergheim-Kenten, and Hans-H. Gildemeister, Overath, both of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 30, 1988, Ser. No. 277,978

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1987, 3744093

Int. Cl.[4] B04B *3/02, 11/08*

U.S. Cl. 494—26 **15 Claims**



1. A solid bowl centrifuge for separating mixtures including different densities into a lighter phase and a heavier phase comprising in combination:

a rotary drum providing a cylindrical settling sump therein and having an inlet for a mixture to be separated and having end walls;

a displacement member rotationally located within the drum having end walls and forming the settling sump between the displacement member and the drum;

means defining a discharge element for lighter phase material in an end wall of the drum;

means defining a discharge element for heavier phase material leading from the settling sump at the deepest location at the outer circumference of the drum;

and a hollow shaft on the displacement member connected to said heavier discharge element for the removal of heavier phase material.

4,898,572

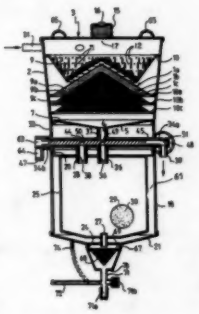
AUTOTRANSFUSER

Evelyne Surugue nee Lasnier; Hubert Lasnier, both of Creteil, and Phillipe Perovitch, Merignac, all of France, assignors to Futur-Quotidien S.A., Merignac, France

Filed Dec. 1, 1987, Ser. No. 127,053

Int. Cl.[4] A61M *37/00*

U.S. Cl. 604—4 **17 Claims**



1. A device for recovering and re-injecting blood into a patient comprising:

(a) suction means for recovering the blood;

(b) a first chamber forming a filtering chamber connected to said suction means;

(c) a plurality of filtering beds inside said filtering chamber;

(d) a source of negative pressure and a source of positive pressure; (e) a first source of anticoagulant products connected to said filtering chamber;

(f) a second chamber forming a blood collecting chamber, located beneath the filtering chamber to receive the blood by gravity from the filtering chamber;

(g) a second source of anti-coagulant products inside said collecting chamber;

(h) second filtration means at the base of said collecting chamber;

(i) means for back-transfusion of blood into the patient's circulatory system from said collecting chamber,

wherein said device further comprises:

(A) a bag of supple plastic material forming said collecting chamber;

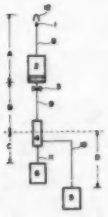
(B) a rigid lower vessel to contain the said bag, wherein the space between the said bag and the walls of said vessel form an air jacket;

(C) a multi-way valve comprising a means defining a plurality of passages connected to said positive pressure source, to said negative pressure source, to said filtering chamber, to said supple plastic bag and to said air jacket, said multi-way valve having a first position whereby the source of negative pressure is connected to said supple bag and said supple bag is connected to the filtering chamber thereby drawing blood from the suction means to the filtering chamber and from there to the supple bag, said valve having a second position whereby the source of positive pressure is connected to the air jacket, and at the same time the supple bag is isolated and closed, whereby the pressure in the air jacket is transmitted to the supple bag causing the blood to be delivered to the back-transfusion means.

4,898,573
BLOOD COMPONENTS COLLECTOR UNIT

Yoshinori Takenaka, Oita; Hirokazu Fukumi, Fuchu, and Sadayoshi Sekiguchi, Sapporo, all of Japan, assignors to Asahi Medical Co., Ltd., Tokyo, Japan

Filed Oct. 29, 1987, Ser. No. 114,020
Claims priority, application Japan, Oct. 29, 1986, 61-255922; Sep. 1, 1987, 62-216517
Int. Cl.[4] A61M 1/34
U.S. Cl. 604—6 10 Claims

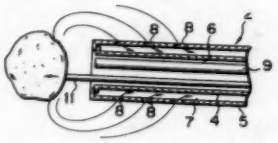


1. A blood components collector unit comprising:
a cannula,
a blood collection bag connected to said cannula through a first tube, said blood collecting bag containing an anticoagulant,
a membrane type blood components separator having a plasma outlet and a blood cell outlet, which separator is connected to said blood collection bag on its side remote from said cannula through a second tube,
said membrane type blood components separator having a membrane moistened with a physiologically isotonic solution which is employed in an amount of A/100 g or less wherein A is a surface area of said membrane expressed in terms of cm^2,
valve means positioned intermediate the length of and within said second tube, which is in the closed state and has opening means for opening said valve means,
said opening means being adapted to permit the opening of the valve means by manual manipulation from outside of said second tube,
a plasma collection reservoir for collecting plasma, and
a blood cell collection reservoir for collecting blood cell-enriched blood,
said plasma collection reservoir and said blood cell collection reservoir being connected to said blood components separator at said plasma outlet through a third tube and at said blood cell outlet through a fourth tube, respectively,
wherein each connection through each tube at both ends thereof is in a fixed fashion, thereby providing unified connection,
and wherein said collector unit is packed in a container in a sterile state,
thereby enabling the blood components collector unit to be stored aseptically for a prolonged period of time and to be readily used for collecting blood from a donor without rinsing the blood components collectors unit with a rinsing solution, leading to elimination of the danger of dilution of the blood components, and wherein said blood collection bag and said value means provide means for decreasing the burden on the donor by allowing the unit to be separated from a donor immediately after completion of the collection of blood from the donor to bag, while allowing continued separation of blood into blood components.

4,898,574
LITHOTOMIC APPARATUS

Naoki Uchiyama, Tokyo; Yoshio Shishido, Sagamihara, and Yasuhiro Ueda, Tokyo, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 45,127, Apr. 30, 1987, abandoned. This application Feb. 1, 1989, Ser. No. 306,267
Claims priority, application Japan, May 8, 1986, 61-105292; May 8, 1986, 61-105295; May 8, 1986, 61-105296; Jul. 24, 1986, 61-174318
Int. Cl.[4] A61B 17/22
U.S. Cl. 604—22 7 Claims

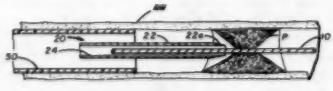


7. A lithotomic apparatus for treating a calculus produced in a body cavity, comprising:
an elongated suction probe, that can be inserted into the body cavity, including a distal channel having a distal end open to the distal end of the probe, an outer tube located around the inner tube with a gap therebetween, a suction channel defined between the inner and outer tubes and having an annular cross section, and a plurality of suction holes formed in the circumferences of the outer tube to communicate with the suction channel and located near the distal end of the probe;
suction means for sucking gas from the suction holes through the suction channel;
an elongated viewing probe, that can be inserted into the instrument channel, for viewing a region near the distal end of the suction probe;
an elongated treating probe, having a nozzle portion at a distal end thereof, that can be inserted into the instrument channel so that the nozzle portion projects from the distal end of the suction probe;
means for supplying a high-pressure fluid, and
a drive means for feeding the high-pressure fluid to the treating probe and pulsatively ejecting the fluid from the nozzle portion.

4,898,575
GUIDE WIRE FOLLOWING TUNNELING CATHETER SYSTEM AND METHOD FOR TRANSLUMINAL ARTERIAL ATHERECTOMY

Robert E. Fischell, Silver Spring, Md., and Tim A. Fischell, Palo Alto, Calif., assignors to MedInnovations, Inc., Dayton, Md.

Continuation of Ser. No. 91,311, Aug. 31, 1987, abandoned, which is a continuation of Ser. No. 874,140, Jun. 13, 1986, abandoned. This application Jun. 10, 1988, Ser. No. 205,541
Int. Cl.[4] A61B 17/32
U.S. Cl. 604—22 36 Claims



9. A guide wire following catheter system for percutaneous transluminal atherectomy, comprising:
a guide wire with distal and proximal ends, and adapted to be advanced within a patient's arterial system and to penetrate through an arterial stenosis, said guide wire being

essentially flexible throughout its length that lies within the stenotic artery and being free of any substantial protuberance at its said distal end; and

a tunneling catheter with distal and proximal ends and having for most of its length a single, thin wall tube having an outer cylindrical surface and an inner cylindrical surface, said inner cylindrical surface forming an interior lumen and being adapted to fit around said guide wire so that said tunneling catheter can be advanced along said guide wire to said arterial stenosis; and,

a cutting means located at the distal portion of said tunneling catheter for cutting through said arterial stenosis as said tunneling catheter is advanced along said guide wire, said cutting means having at least one cutting edge and having at least one opening into which the cut plaque enters as said cutting means is advanced through the stenotic plaque, and wherein none of said cutting edges extends outward from said outer cylindrical surface of said tunneling catheter and wherein said cutting means is precluded from cutting through said guide wire during rotation of said tunneling catheter as a result of said inner cylindrical surface of said tunneling catheter being a smooth cylindrical surface and being free of a cutting edge which could cut through said guide wire and wherein the inner diameter of said distal end of said tunneling catheter is only slightly larger than the outside diameter of said guide wire so that said distal end of said tunneling catheter is substantially centered about said guide wire; and wherein said tunneling catheter has a passageway formed between said inner cylindrical surface of said tunneling catheter and the outer surface of said guide wire, said passageway being in fluid communication between said distal and proximal ends of said tunneling catheter and being a means for collecting and removing cut plaque as said cutting means is advanced over said guide wire so as to cut the stenotic plaque.

4,898,576

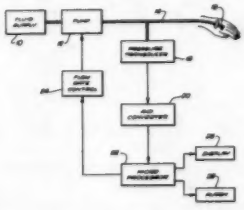
INTRAVENOUS FLUID FLOW MONITOR

James H. Philip, 75 Francis St., Boston, Mass. 02115

Continuation of Ser. No. 81,613, Jul. 31, 1987, abandoned, which is a continuation of Ser. No. 872,199, Jun. 6, 1986, abandoned. This application Aug. 22, 1988, Ser. No. 236,341

Int. Cl.[4] A61M *5/14*

U.S. Cl. 604—50 **23 Claims**



1. A system for monitoring the flow of fluid through a fluid delivery system to a patient comprising:

(a) means for monitoring fluid pressure in the fluid delivery system supplying fluid to a patient;

(b) means for controlling the fluid flow through the fluid delivery system at sequentially different flow rates in a predetermined manner;

(c) means responsive to the sensed pressures and the sequentially different fluid flow rates, for determining resistance to fluid flow in the fluid delivery system; and

(d) means for comparing the determined resistance with predetermined limits and for generating output signals responsive thereto.

4,898,577

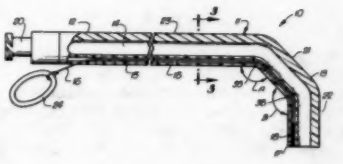
GUIDING CATHETHER WITH CONTROLLABLE DISTAL TIP

Rodney S. Badger, Morago; Lawrence D. Wasicek, Sunnyvale, and Bruce H. Wand, San Jose, all of Calif., assignors to Advanced Cardiovascular Systems, Inc., Mountain View, Calif.

Filed Sep. 28, 1988, Ser. No. 250,709

Int. Cl.[4] A61M *25/00*

U.S. Cl. 604—53 **12 Claims**



1. A guiding catheter comprising:

(a) a tubular member having a proximal portion, a main portion, and a distal portion, the distal portion having at least one section which is performed at an angle with respect to the main portion;

(b) a first lumen of relatively large diameter disposed within the tubular member which extends along the length thereof and which is adapted to receive catheters or guidewires therethrough;

(c) a second lumen of relatively small diameter disposed within the tubular member, extending along the length thereof;

(d) a control line which is disposed within the second lumen and which is secured at the disposed tip thereof to the distal portion of the tubular member; and

(e) means at the proximal end of the control line to axially move the control line within the second lumen to thereby change the preformed angle between a section of the distal portion of the catheter and the main portion thereof.

4,898,578

DRUG INFUSION SYSTEM WITH CALCULATOR

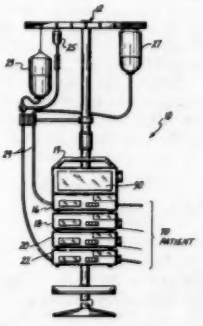
Bernardino Rubalcaba, Jr., Laguna Beach, Calif., assignor to Baxter International Inc., Deerfield, Ill.

Filed Jan. 26, 1988, Ser. No. 148,554

The portion of the term of this patent subsequent to Jul. 12, 2005, has been disclaimed.

Int. Cl.[4] A61M *5/16*

U.S. Cl. 604—66 **25 Claims**



1. A drug infusion system, comprising:

a plurality of infusion pump modules and a central management unit interconnected with the infusion pump modules

to provide centralized control, the central management unit including means for communicating with a user that includes:

(a) means for enabling the user to initiate the display of a menu of infusion-rate-related parameters;

(b) means for enabling the user to selectively assign values for any of the parameters in the menu; and

(c) means for automatically calculating an infusion rate value according to the values so assigned for purposes of controlling the infusion pump modules accordingly.

4,898,579

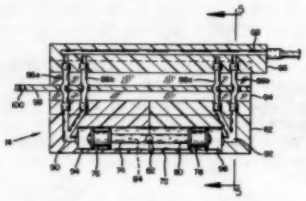
INFUSION PUMP

Leroy E. Grosbong, Portland; Judson C. Grosbong, Beaverton, both of Oreg., and R. James Brawn, deceased, late of Portland, Oreg. (by Stanley C. Fisher, administrator), assignors to Pump Controller Corporation, Portland, Oreg.

Division of Ser. No. 67,700, Jun. 26, 1987, Pat. No. 4,838,860. This application Jun. 3, 1988, Ser. No. 201,951

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—67 **10 Claims**



1. An infusion pump for administering fluid from a fluid source through an outlet to a patient at a controlled average volumetric flow rate comprising:

(a) pump means for pumping fluid from said fluid source through said outlet at an average volumetric flow rate proportional to the average rate of movement of said pump means;

(b) electric motor means for moving said pump means; and

(c) control means for controlling the average rate at which said electric motor means moves said pump means, said control means comprising time-based means for repeatedly initiating motor-driving electric energy at a predetermined time rate, and position-based means for repeatedly terminating said energy in response to the advancement of said motor means beyond respective predetermined positions after respective initiations of said energy, said respective predetermined positions being separated by identical increments of movement of said motor means;

(d) said electric motor means comprising a rotary brushless permanent magnet motor, having a rotor with permanent magnet poles and magnetic field sensor means for sensing the magnetic fields of said poles and thereby indicating the angular position of said rotor, said position-based means being responsive to the position of said rotor as indicated by said magnetic field sensor means.

4,898,580

SYRINGE FOR A LIQUID PHARMACEUTICAL COMPOSITION

Patrick J. Crowley, Epsom, England, assignor to Beecham Group p.l.c., Middlesex, England

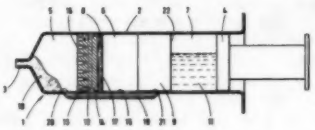
Filed Oct. 4, 1988, Ser. No. 253,677

Claims priority, application United Kingdom, Oct. 6, 1987, 8723454

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—90 **7 Claims**

1. A syringe for dispensing a liquid pharmaceutical composition, comprising a first chamber, adjacent the syringe outlet, for holding a first moisture sensitive component of the composition, a second chamber, adjacent the first chamber, containing moisture sequestering material, the second chamber being separated from the first chamber by a first barrier member movable within the syringe in response to fluid pressure, a third chamber, separated from the second chamber by a further movable barrier member, for holding a second, liquid component of the composition and being closed by a syringe plunger, and a liquid by pass around and outside the second chamber, for connecting the liquid component in the third chamber when the further movable barrier member reaches a predetermined position in the syringe in response to a compressive force from the plunger.



4,898,581

DEVICE FOR ADMINISTERING LIQUID

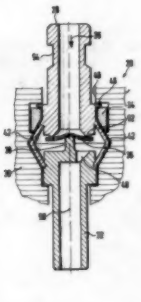
Peter Iwatschenko, Neunkirchen, Fed. Rep. of Germany, assignor to Pfrimmer-Viggo GmbH & Co. KG, Erlangen, Fed. Rep. of Germany

Continuation of Ser. No. 157,917, Feb. 19, 1988, abandoned. This application Jun. 5, 1989, Ser. No. 364,546

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1987, 3705357; European Pat. Off., Oct. 29, 1987, 87115896

Int. Cl.[4] A61M *5/00*; E16K *5/14*

U.S. Cl. 604—122 **8 Claims**



1. A check valve for a device for parenteral administration of a liquid, which comprises:

a tube segment connector having an annular valve seat at one end and a central axis;

a tube connector piece adjacent to the tube segment connector, the tube connector piece having a central axis and a peg centrally located on one end, wherein the annular valve seat is located adjacent to the peg and the central axes of the tube connector piece and the tube segment connector are aligned to form a central axis of the check valve;

an elastic membrane suspended perpendicular to the central axis of the check valve between the annular valve seat and the peg and biased against the annular valve seat by the peg, the peg being displaceable along the central axis of the check valve by a bellows surrounding the annular valve seat; and

a selectively positionable locking means for variably compressing the bellows and displacing he peg so as to adjust

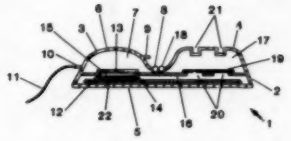
the bias of the membrane against the annular valve seat thereby adjusting the opening pressure of the check valve.

4,898,582

PORTABLE INFUSION DEVICE ASSEMBLY

Rolf A. Faste, Stanford, Calif., assignor to Pharmetrix Corporation, Menlo Park, Calif.

Filed Aug. 9, 1988, Ser. No. 230,620
Int. Cl.[4] A61M *5/14*
U.S. Cl. 604—141 **8 Claims**



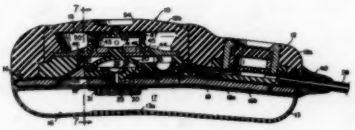
1. A portable infusion device assembly, comprising;
(a) a housing, defining first and second compartments disposed in side-by side relationship to one another,
(b) an osmotic pump, disposed within said first compartment,
(c) a driving liquid for said pump disposed within said second compartment,
(d) wick means, disposed within said housing, in liquid transferring relationship between said first and second compartments,
(e) a barrier disposed between said wick means and said driving liquid, and separating said driving liquid from said wick, and
(f) means integral with said housing or said barrier for rupturing said barrier so that upon rupture of said barrier, said driving liquid will be transferred by said wick from said second compartment to said first compartment.

4,898,583

IMPLANTABLE PATIENT-ACTIVATED FLUID DELIVERY DEVICE AND OUTLET VALVE THEREFOR

Alexander S. Borsanyi, Newport Beach, and Russell J. Redmond, Goleta, both of Calif., assignors to Baxter Healthcare Corporation, Deerfield, Ill.

Filed May 18, 1988, Ser. No. 195,770
Int. Cl.[4] A61N *1/00*
U.S. Cl. 604—153 **5 Claims**



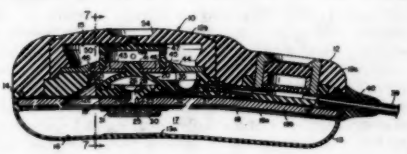
1. An implantable patient-activated device for dispensing metered amounts of fluid to such a patient, comprising a casing formed of soft, deformable polymeric material having a top wall and a bottom wall defining a fluid reservoir with an outlet port; pumping means within said casing including a compressible pump housing having a pumping chamber; first passage-providing means defining an inlet passage extending between said reservoir and said chamber; inlet valve means restricting flow through said inlet passage from said chamber to said reservoir; second passage providing means defining an outlet passage extending between said chamber and said outlet port; outlet valve means along said outlet passage for controlling flow therethrough; said outlet valve means including an annular valve seat of elastomeric material providing a valve opening and a cup-shaped valve member formed of elastomeric material having an outer surface normally sealingly engaging said valve seat; said top wall of said casing having a target zone operatively connected to said pump housing and deformable by finger pressure to compass said pump housing; said valve seat and valve member being deformable together, when said target zone is depressed to compass said pump housing and displace fluid from said chamber, until said seat reaches a limit of deformation and said valve member breaks away from said seat to allow fluid to surge through said outlet passage, said breakway and surge providing tactile feedback to signal a user applying finger pressure to said target zone that a metered amount of fluid has been discharged from said device; said body portion of said valve member including a base having a truncated stem portion; said truncated stem portion having an outer surface sealingly engageable with said deformable annular valve seat.

4,898,584

IMPLANTABLE PATIENT-ACTIVATED FLUID DELIVERY DEVICE

Alexander S. Borsanyi, Newport Beach; Russell J. Redmond, Goleta; Claude A. Vidal, Santa Barbara, and Edmund E. Spaeth, Orange, all of Calif., assignors to Baxter Healthcare Corporation, Deerfield, Ill.

Filed May 18, 1988, Ser. No. 195,702
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—153 **15 Claims**



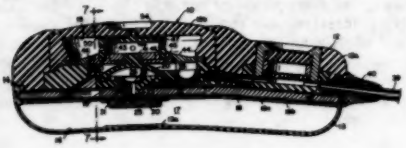
1. An implantable, patient-activated device for dispensing metered amounts of fluid to a patient, comprising a casing formed of soft, deformable polymeric material having a top wall and a bottom wall defining a fluid reservoir with an outlet port; a rigid support plate within said casing dividing said reservoir into upper and lower chambers and having an opening therethrough placing said chambers in communication with each other; pumping means mounted upon said plate within said upper chamber and comprising a compressible pump housing defining a pump cavity; first passage-providing means defining an inlet passage extending from said lower chamber to said cavity; inlet check valve means along said inlet passage; second passage-providing means defining an outlet passing extending from said cavity to said outlet port; outlet check valve means along said outlet passage; said top wall having a flexible pump-actuating zone; and connecting means within said upper chamber connecting said pump-actuating zone and said pump housing so that when said pump-actuating zone is depressed said pump housing is compressed to discharge from said outlet port an amount of fluid substantially equal to the volume of said pump cavity; said pump-actuating zone of said top wall being piercable by an injection needle and said pump-actuating zone also functioning as a target zone for the injection of fluid into said reservoir; and barrier means within said upper chamber for shielding said pump housing against contact by an injection needle inserted through said target zone; said barrier means including a rigid, needle-impenetrable disc connected to and extending over said pump housing.

4,898,585

IMPLANTABLE PATIENT-ACTIVATED FLUID DELIVERY DEVICE WITH BOLUS INJECTION PORT

Alexander S. Borsanyi, Newport Beach, and Michael L. Jones, Huntington Beach, both of Calif., assignors to Baxter Healthcare Corporation, Deerfield, Ill.

Filed May 18, 1988, Ser. No. 195,769
Int. Cl.[4] A61M 1/00
U.S. Cl. 604—153 **2 Claims**



1. An implantable, finger-pressure-activated device for dispensing metered amounts of fluid to a patient, comprising a casing formed of soft deformable polymeric material having a top wall and a bottom wall defining a fluid reservoir with an outlet port; pumping means within said casing comprising a compressible pump housing having a pumping chamber; said casing including an enlarged body portion and a reduced lateral portion; said top wall of said body portion having a central target zone for finger pressure activation of said pump when said target zone is depressed; and said reduced lateral portion having a bolus injection chamber communicating with said outlet port; said top wall of said reduced lateral portion having a bolus injection port adjacent said bolus injection chamber with said bolus injection port separated from said chamber by a needle-piercable self-sealing elastomeric membrane; first passage-providing providing means being provided within said casing and defining an inlet passage extending from said reservoir to said pump chamber an annular valve seat at one end of said inlet passage facing said pump housing within said pump chamber; an elastomeric inlet valve member mounted within said pump chamber and normally engaging said valve seat to close said inlet passage; second passage-providing means defining an outlet passage extending from said pump chamber to said outlet port; said bolus-receiving chamber communicating with said outlet passage; whereby, medicament injected into said outlet passage through said bolus injection port is prevented from entering said inlet passage and said reservoir by said inlet valve member; and a grid member being mounted in said inlet valve passage; said grid member having a flow passages extending longitudinally therethrough and an end portion surrounded by said valve seat for engaging and bracing said elastomeric inlet valve member when back pressure develops in said pump chamber.

4,898,586

SUCTION CATHETER AND STORAGE HOLDER AND PACKAGE

Suellen McDonough, Durham, N.H., assignor to The Academy of Applied Science, N.H.

Filed Nov. 19, 1987, Ser. No. 122,374
Int. Cl.[4] A61M 5/00
U.S. Cl. 604—171 **6 Claims**

1. A sterile suction catheter and sheath package in which the sheath serves also as a storage holder having, in combination, a flexible catheter tube open at one end and connected at the other end in an outlet stem of a valve T-stem section connector having inlet and outlet stems, the inlet stem of which is connectable to a suction hose; a packaging-and-storage sheath of tubing, in which the catheter is originally sterilely packaged end at least of the length of the catheter tube, open at one end and closed at the other end and of cross-section larger than that of the catheter tube for receiving the same therein and therealong; the said outlet stem having an enlarged region of cross dimension sufficient rigidly to seal within and against the said one end of the sheath when the catheter is fully inserted within the sheath and removable from said one end of the sheath to

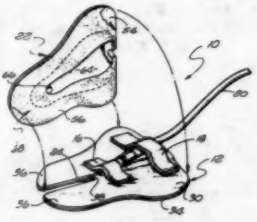
permit withdrawal of the catheter from the sheath, and then reinsertable within the sheath to re-seal within and against said one end of the sheath for repeated storage usage.

4,898,587

INTRAVENOUS LINE STABILIZING DEVICE

Csaba L. Mera, 1025 E. Ocean Ave., Suite B, Lompoc, Calif. 93436

Filed Nov. 15, 1988, Ser. No. 271,618
Int. Cl.[4] A61M 5/32
U.S. Cl. 604—174 **22 Claims**



1. An intravenous line stabilizing device, comprising:

base means for adhering the stabilizing device to a part of a body, the base means including an upper surface, a lower surface, and a plurality of limbs, wherein two adjacent limbs adjoin one another at a crotch;

means for securing an intravenous line to the upper surface of the base means; and

cover means for overlying at least portions of the base means and the intravenous line, the cover means being adhered to the upper surface of the base means in a manner providing a continuous bridging surface between the two adjacent limbs, wherein the cover means includes cushion means for shielding the covered portion of the intravenous line from externally applied impact forces.

4,898,588

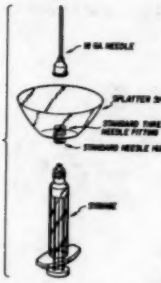
HYPODERMIC SYRINGE SPLATTER SHIELD

Christopher W. Roberts, P.O. Box 445, Derby Line, Vt. 05830

Filed Oct. 17, 1988, Ser. No. 258,790

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—187 **6 Claims**



1. A splatter shield for use with a hypodermic syringe during wound lavage, comprising a sheet of stiff material and a central tube which is attached to the sheet as it passes through the center thereof, said tube projecting on at least one side of said sheet and having one end adapted to receive a standard syringe fitting and the other end adapted to receive a standard hypodermic needle, wherein the shape of the sheet is a cone or a conic frustum of about 60° to 180° with the concavity of the cone being on the side of the sheet having the needle-receiving central tube end, and wherein the size and degree of concavity of the sheet is such as to allow the hypodermic needle, in use, to project below the base of the cone to the extent of about 10% to about 50% of the needle's length.

4,898,589

FLUID PASSING APPARATUS WITH MEANS FOR COVERING THE SAME

Stuart M. Dolgin, 95 Belvedere Dr., Syosset, N.Y. 11791, and Philip Torbet, Brookville, N.Y., assignors to Stuart M. Dolgin, Syosset, N.Y.

Continuation-in-part of Ser. No. 166,046, Mar. 9, 1988, abandoned, which is a continuation-in-part of Ser. No. 135,581, Dec. 21, 1987, abandoned. This application Sep. 7, 1988, Ser. No. 241,352

Int. Cl.[4] A61M *5/32*

U.S. Cl. 604—198 **16 Claims**

1. Apparatus for passing a fluid into or out of a warm-blooded animal or tissue thereof comprising:

(a) a body adapted to contain said fluid;

(b) a needle assembly in flow communication with said body and adapted to penetrate the warm blooded animal or tissue thereof comprising:

(i) a base having a pair of opposed ends,

(ii) needle means affixed to one end of the base, and

(iii) means for releasably securing the other end of the base to the body;

(c) means for mounting the needle assembly on the exterior surface of the body;

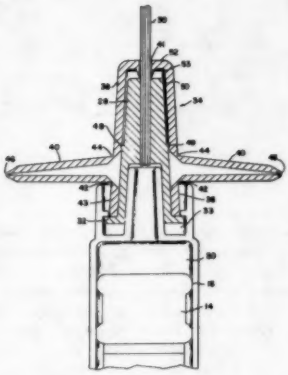
(d) means for urging said fluid out of or into said body through said needle assembly; and

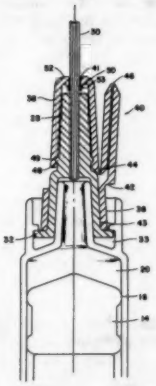
(e) cover means comprising;

(i) a body having a top end including an opening for passage of the needle means,

(ii) a bottom end adapted to be secured to the base of the needle assembly,

(iii) at least one pair of arms hingedly attached to each other, one of said arms hingedly attached to the top end of the cover body and the other of said arms hingedly attached to the bottom end of the cover body, whereby the cover body moves from a retracted position wherein the needle means extends through the opening in the top end of the cover body and is in the operable position for passing fluid into or out of said warm-blooded animal, to an extended position wherein the





cover body moves upwardly and above the needle means thereby encasing the needle means within the cover body, and

(iv) means operatively interconnecting the cover body to the needle assembly for releasably retaining the cover body in the retracted position.

4,898,590

SYRINGE HAVING PROTECTIVE SLEEVE

Leonard Andors, Brookhaven, N.Y., assignor to Research Foundation of the State University of N.Y., Albany, N.Y.

Filed Jun. 24, 1988, Ser. No. 211,476

Int. Cl.[4] A61M *5/32*

U.S. Cl. 604—198 **13 Claims**

1. A syringe comprising:

a barrel including longitudinal walls defining an elongate chamber therein for receiving a cartridge;

a first, elongate opening defined within said longitudinal walls through which a cartridge may be inserted into said chamber;

a second opening defined within said longitudinal walls of said barrel, said second opening in opposing relation to said first, elongate opening;

a sleeve slidably mounted to said barrel, said sleeve including a first, elongate opening and a second opening, said

second sleeve opening being in opposing relation to said first, elongate sleeve opening, said sleeve being movable to a position with respect to said barrel such that said first and second sleeve openings are substantially in register with said first and second barrel openings; and

means for retaining said sleeve upon said barrel.

4,898,591

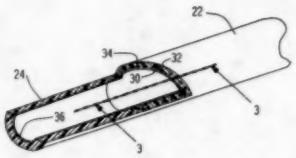
NYLON-PEBA COPOLYMER CATHETER

Yue-Teh Jang, Houston; Vern L. Liebmann, Sugar Land; Glenda S. Villman, Freeport, all of Tex., and Surendra A. Amin, Lake Charles, La., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Filed Aug. 9, 1988, Ser. No. 229,991

Int. Cl.[4] A61M *25/00*

U.S. Cl. 604—282 **18 Claims**



1. An intravascular catheter comprising

a tubular body formed with inner and outer polymer layers with a reinforcing braid layer formed between the inner and outer layers, and

a soft flexible tubular tip formed from a polymer and having one end bonded to an end of the tubular body,

said polymers of said inner and outer layers and said tip including a blend of nylon and a copolymer of ester linked polyethylene and polyamide.

4,898,592

MEANS FOR THE APPLICATION OF TRANSDERMALLY ABSORBABLE ACTIVE SUBSTANCES

Arno W. Latzke; Ralf Latzke, and Gert Latzke, all of Mühltobel 946, CH-9429 Zelg/Wolfhalden, Switzerland

Continuation of Ser. No. 42,344, Apr. 24, 1987, abandoned. This application Sep. 16, 1988, Ser. No. 245,923

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1986, 3628688; Aug. 30, 1986, 3629565; European Pat. Off., Feb. 18, 1987, 87102306.5

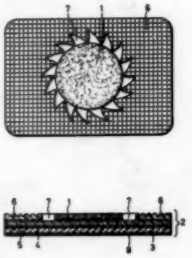
Int. Cl.[4] A61F *13/02*

U.S. Cl. 604—307 **22 Claims**

1. A device for application of a heated transdermally absorbable active substance to skin, comprising at least one replaceable carrier impregnated with a transdermally absorbable active substance, and a laminate support housing the carrier comprising:

(a) a first closed-cell polyethylene foam layer having a thickness of 2 to 6 mm, said first foam layer including a foil-facing area and a laminate-contacting area defined on a first surface, and an opposite surface,

(b) a second closed-cell polyethylene foam layer having a thickness of 2 to 5 mm, said second foam layer including



a laminate-contacting surface bonded to said laminate-contacting area of the first foam layer and an opposite, skin-contacting surface, wherein at least one portion of said second foam layer has been removed to define pink-shaped side walls housing the carrier, and

(c) a flexible heat-conductive metal foil, said metal foil including a first surface facing said foil-contacting surface of the first foam layer and an opposite surface facing said carrier.

4,898,593

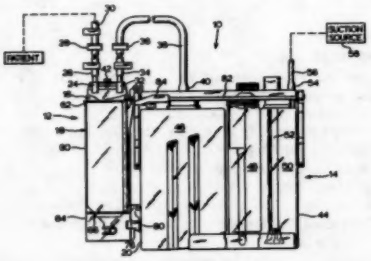
AUTOTRANSFUSION BAG HOLDER

David R. Swisher, St. Louis, and F. Thane DeWeese, Ladue, both of Mo., assignors to Sherwood Medical Company, St. Louis, Mo.

Filed Aug. 29, 1988, Ser. No. 238,366

Int. Cl.[4] A61M *1/00*

U.S. Cl. 604—319 **9 Claims**



1. An attachment device for attaching a collection bag to a drainage unit comprising

a collection bag holder having top and bottom ends and including an upper arm near said top end and a lower projection spaced below said upper arm near said bottom end,

a drainage unit having top and side surfaces and including an upper bracket with a vertically extending arm rigidly attached adjacent said top surface and a lower first fastener surface on said side surface,

the upper arm further including an extension for releasably

engaging an opening in said bracket of said drainage unit to form a first attachment means,

said lower projection further including a second fastener surface for releasably engaging the first fastener surface on said side surface of said drainage unit to form a second attachment means, and

wherein said first and second attachment means limit the horizontal and vertical movement of the collection bag holder about the drainage unit and wherein said second attachment means prevents rotation about the first attachment means.

4,898,594

INCONTINENCE APPAREL FOR FEMALES

Alan M. Cottenden, Brickhill, Bedfordshire, England, assignor to National Research Development Corporation, London, England

Continuation of Ser. No. 937,027, Jan. 5, 1987, abandoned. This application Aug. 11, 1988, Ser. No. 231,649

Claims priority, application United Kingdom, Mar. 15, 1985, 8506790

Int. Cl.[4] A61F *13/16*

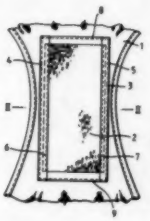
U.S. Cl. 604—397 **9 Claims**

1. A garment for use by an incontinent subject, having inner and outer surfaces respectively for location, in use, nearer to and further from said subject, and comprising:

an absorbent pad located over an area of said garment inner surface;

a sheet of liquid impermeable material having greater transverse dimensions than said area of said garment, with a central potion of said sheet being interposed between said area of said garment and said pad and with further portions of said sheet being conformed to pass over the sides of said pad and slightly across the surface of said pad remote from said area so that said sheet has a trough-like shape around said pad, remaining peripheral portions of said sheet being turned in folds to pass back across said remote surface of said pad and into engagement with said garment beyond said area;

first stitching formed through said sheet folds and said pad to interconnect the same without penetrating said area of said garment and without penetrating the portion of said sheet which is interposed between said area and said pad; and



second stitching formed through said sheet peripheral portions and said garment to interconnect the same without penetrating said area of said garment and without penetrating the portion of said sheet interposed between said area and said pad.

CHEMICAL

4,898,595

COLORING KERATINOUS MATERIAL

Petrina F. Fridd, and Rosemary M. Taylor, both of Wales, United Kingdom, assignors to Dow Corning Limited, Barry, Wales

Filed Feb. 17, 1987, Ser. No. 15,185
Claims priority, application United Kingdom, Feb. 26, 1986, 8604705; Jan. 12, 1987, 8700620
Int. Cl.[4] A61K 7/06, 7/13
U.S. Cl. 8—405 12 Claims

1. In a method of coloring keratinous material by means of a hair colorant system, wherein the improvement comprises applying to said keratinous material a polysiloxane comprising from 0.1 to 100% of the total number of siloxane units, siloxane units having the general formula

$$R_aSiO_{(3-a)/2} \quad (i)$$

wherein R represents a monovalent hydrocarbon group having 1 to 12 inclusive carbon atoms, or an alkoxy or alkoxyalkoxy group, in which each alkoxy group has up to 7 carbon atoms and a is 1 or 2,
the balance of the siloxane units of the polysiloxane having the general formula

$$Z_cSiO_{(4-c)/2} \quad (ii)$$

wherein Z represents a monovalent hydrocarbon group having 1 to 12 inclusive carbon atoms, or an alkoxy or alkoxyalkoxy group in which each alkoxy group has up to 7 carbon atoms and c is 0, 1, 2 or 3,
the resulting polysiloxane having a degree of polymerization in the range of from 600 to 1700.

4,898,596

EXHAUST PROCESS FOR SIMULTANEOUSLY DYEING AND IMPROVING THE FLAME RESISTANCE OF ARAMID FIBERS

Phillip H. Riggins, and Peter J. Hauser, both of Greensboro, N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Continuation of Ser. No. 139,761, Dec. 30, 1987, abandoned.
This application Jan. 9, 1989, Ser. No. 295,001
Int. Cl.[4] D06P 5/00
U.S. Cl. 8—490 16 Claims

1. A process of dyeing poly(m-phenyleneisophthalamide) fabric comprising:
(1) dyeing the fabric at about 120° C. to about 150° C. and at elevated pressure in a fiber-dyeing solution containing a tinctorial amount of at least one dye and a dye diffusion promoting amount of N-cyclohexyl-2-pyrrolidone, then
(2) heating the fabric while in contact with the solution until the desired degree of dyeing is attained.

4,898,597

FRIT BONDED ABRASIVE WHEEL

John Hay, Shrewsbury; Carole J. Markhoff-Matheny, Leicester, and Brian E. Swanson, Northboro, all of Mass., assignors to Norton Company, Worcester, Mass.

Filed Aug. 25, 1988, Ser. No. 236,586
Int. Cl.[4] C09K 3/14
U.S. Cl. 51—298 9 Claims

1. A grinding wheel comprised of abrasive grain and a vitrified bond therefor, said abrasive grain consisting essentially of from 10% to 100% by weight of a polycrystalline sintered aluminous abrasive and from 0% to 90% by weight of a second type of abrasive, and wherein said vitrified bond contains at least 40% by weight of frit.

4,898,598

COMPOUND AND METHOD FOR POLISHING STONE

Manuel Zapata, Dallas, Tex., assignor to Superior Granite & Marble Restoration, Dallas, Tex.

Filed Oct. 27, 1988, Ser. No. 263,350
Int. Cl.[4] B24D 3/02
U.S. Cl. 51—309 9 Claims

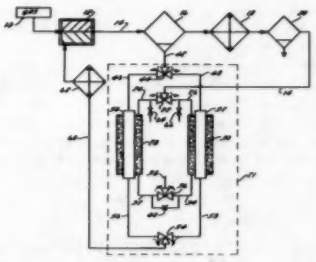
1. A compound for polishing stone comprising a mixture of aluminum and stannous metallic oxides, a natural resin wax and a pre-prepared gel.

4,898,599

DESICCANT GAS DRYING SYSTEM

Bernard W. Settlemyer, Ocala, Fla., assignor to Pneumatic Products Corporation, Ocala, Fla.

Filed May 12, 1989, Ser. No. 352,373
Int. Cl.[4] B01D 53/04
U.S. Cl. 55—28 9 Claims



1. A method for producing a dried, compressed gas, which comprises:
compressing a moist gas in the presence of an oil to produce a hot, compressed, moisture-laden, oily gas;
separating hot oil from said compressed gas; and
alternately contacting said gas with an adsorbent which adsorbs moisture from said gas and transferring heat from said hot oil to said absorbent to intermittently desorb moisture from said absorbent.

2. An apparatus for compressing and drying a gas, comprising:
a gas compressor having means for producing a hot, compressed, moisture-laden, oily gas and means for separating hot oil from said compressed gas;
a dryer connected to said compressor for receiving said compressed gas from said compressor, said dryer having an adsorbent capable of alternately assuming a moisture adsorbing condition and a regenerating, moisture desorbing condition, and conduit means for circulating said compressed gas through said adsorbent to dry said compressed gas; and
means connected to said compressor and said dryer for intermittently transferring heat from said hot oil to said adsorbent to cause said adsorbent to assume said regenerating condition.

4,898,600

APPARATUS FOR RECOVERING HIGH TEMPERATURE BLAST FURNACE GAS

Genichi Ishibashi; Hideyuki Kamano, and Masahiko Seki, all of Chiba, Japan, assignors to Kawasaki Steel Corp., Japan

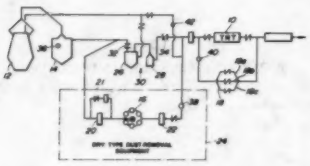
Filed Jul. 26, 1988, Ser. No. 224,487
Claims priority, application Japan, Jul. 31, 1987, 62-116599
Int. Cl.[4] B01D 53/14
U.S. Cl. 55—222 30 Claims

1. A blast furnace gas circulation system comprising:
a turbine driven by blast furnace gas for generating an elec-

tric power, said turbine having a turbine blade having a first heat resisting temperature;

a gas flow passage connecting top of a blast furnace to said turbine;

a dry type dust removing equipment disposed in said gas flow passage and designed for removing dust in said blast furnace gas, said equipment having a filter element having a second heat resisting temperature which is higher than said first heat resisting temperature;



a first cooling equipment provided upstream of said dry type dust removing equipment for cooling said blast furnace gas to a temperature lower than said second heat resisting temperature; and

a second cooling equipment provided downstream of said dry type dust removing equipment and upstream of said turbine, said second cooling equipment being responsive to said blast furnace gas temperature at upstream thereof higher than said first heat resisting temperature for cooling said blast furnace gas to the temperature lower than said first heat resisting temperature.

4,898,601

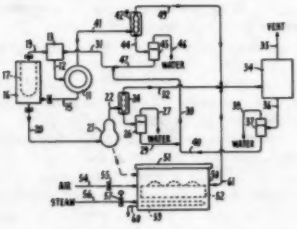
DRYCLEANING RESIDUE AFTERCOOKER

Michael E. Casey, 655 Palo Alto Ave., Mountain View, Calif. 94041

Continuation of Ser. No. 215,076, Jul. 5, 1988, abandoned, which is a continuation of Ser. No. 800,506, Nov. 21, 1985, abandoned. This application Jun. 1, 1989, Ser. No. 361,742

Int. Cl.[4] B01D *46/02, 53/04*

U.S. Cl. 55—341 R **8 Claims**



1. A dry cleaning solvent recovery system for separating contaminant-laden halohydrocarbon dry cleaning fluid into reusable clean dry cleaning solvent and solvent free solid residue comprising

a dry cleaning machine employing halohydrocarbon dry cleaning fluid and capable of generating a spent liquid comprising solid soil and filter aid in said halohydrocarbon dry cleaning fluid, said machine having a vent and a vent scrubber capable of removing and recovering dry cleaning solvent vapors from said vent,

means for recovering clean dry cleaning solvent from said spent liquid and generating a high solvent content residue phase comprising a mixture of soil and filter aid together with dry cleaning solvent, means for transferring said residue phase to a dry cleaning residue aftercooker device comprising a vapor-sealed enclosure having a vapor sealable opening adapted for receiving into said enclosure the high solvent-content dry cleaning residue phase, means for controlling the temperature within said enclosure to within the range of 65° F. to 175° F. means for admitting a flow of air into said enclosure into contact with said dry cleaning residue, and means for withdrawing a flow of solvent-vapor-enriched air from said enclosure and conducting said solvent-vapor-enriched air to said vent scrubber system present in said dry cleaning machine.

4,898,602

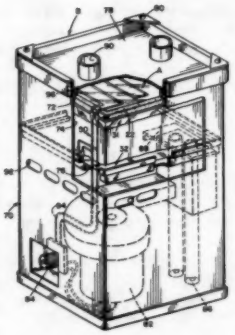
SELECTIVELY OPENABLE FILTERING ASSEMBLY

Thomas J. Gruber, 6805 Mayfield Rd., Bldg. B, Ste. 1114, Mayfield Heights, Ohio 44124

Filed Mar. 28, 1988, Ser. No. 174,100

Int. Cl.[4] B01D *46/00*

U.S. Cl. 55—359 **22 Claims**



18. A remotely openable assembly comprising:

a container having contents;

a cover means for sealing said container contents against communication with the surrounding environment, said cover means comprising a layer of a thermoplastic material; and,

a remotely activated means for opening said cover means for allowing said container contents to communicate with the surrounding environment, wherein said remotely activated means comprises a means for generating heat to sever said layer of thermoplastic material, after which said material shrivels up in order to expose said container contents to the surrounding environment.

4,898,603

METHOD FOR MANUFACTURING HALIDE GLASS OPTICAL FIBER

Joseph J. Hutta, Groton, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 25, 1988, Ser. No. 223,185

Int. Cl.[4] C03B *15/16, 37/018*

U.S. Cl. 65—3.13 **3 Claims**

1. A process of manufacturing a clad optical halide glass fiber, said process comprising the steps of:

(a) providing a heavy metal fluoride core-glass melt, said melt being within a desired temperature range;

(b) providing a clad-glass melt, said clad-glass melt being within a desired temperature range;

(c) causing said core-glass melt to flow through a core conduit;

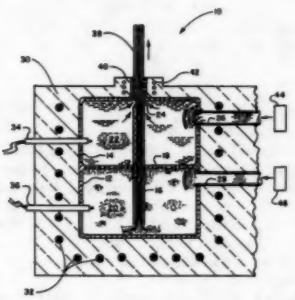
(d) causing said clad-glass melt to flow through an orifice;

(e) positioning an output end of said core conduit centrally near said orifice such that said core-melt is cylindrically

enclosed by said clad-glass melt whereby a HMFG optical fiber is formed in a molten condition;

(f) maintaining the molten optical fiber flowing through a die nozzle within a desired temperature range;

(g) extruding said molten optical fiber from said die nozzle in a vertical direction;



(h) drawing said molten optical fiber in a vertical direction counter gravity; and

(i) allowing said molten optical fiber to cool to form a solid optical fiber.

4,898,604

METHOD OF MANUFACTURING A BLANK FOR A LIGHT-WEIGHT MIRROR WITH A SUPPORTING STRUCTURE

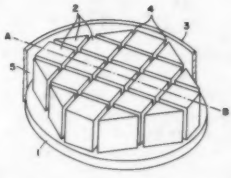
Paul Sauerwein, Rodenbach, Fed. Rep. of Germany, assignor to Heraeus Quarzschmelze GmbH, Hanau, Fed. Rep. of Germany

Continuation of Ser. No. 841,915, Mar. 20, 1986, abandoned. This application Mar. 1, 1988, Ser. No. 165,447

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1985, 3510414

Int. Cl.[4] C03B *23/207*

U.S. Cl. 65—18.1 **8 Claims**



1. A method of manufacturing a light-weight mirror with a supporting structure having means defining cells and that is fastened securely to a mirror plate, wherein the materials selected for the supporting structure and for the mirror plate have practically the same coefficient of thermal expansion and wherein the method comprises manufacturing the supporting structure by positioning mutually separated graphite molding bodies directly on a base in the form of a plate, said plate being a mirror plate, surrounding the molding bodies with a wall of graphite, filing the interstices between the individual molding bodies and between the molding bodies and the wall with a granulate of crystalline or amorphous quartz to create part of the supporting structure, placing the resultant overall assembly in a furnace where the assembly is heated in a non-oxidizing atmosphere for 2 to 6 hours under a pressure of 2×10^{-2} to 2 mbars at a temperature of 1710° C., to 1780° C. cooling the resulting bonded assembly within the furnace, and removing the graphite molding bodies once the assembly has cooled.

4,898,605

GLASS VESSEL IN PARTICULAR, AN AMPOULE AND A METHOD FOR TREATING THE GLASS VESSEL

Reinhard Manni, Mitterteich, Fed. Rep. of Germany, assignor to Schott Ruhrglas GmbH, Postfach, Fed. Rep. of Germany

Continuation of Ser. No. 46,383, May 6, 1987, abandoned. This application Apr. 21, 1989, Ser. No. 370,053

Claims priority, application Fed. Rep. of Germany, May 6, 1986, 3615287

Int. Cl.[4] C03B *33/09*

U.S. Cl. 65—113 **9 Claims**

1. A method of forming a pre-stressed strip in a glass vessel such as an ampoule to facilitate the opening of the vessel along the strip, said method comprising forming in a portion of said vessel designated for placement of the pre-stressed strip, a tensile stress zone solely by heating said zone, and after said zone has cooled forming in said zone a short compressive stress zone solely by heating a short section of said tensile stress zone.

5. A method of forming a pre-stressed strip in a glass vessel such as an ampoule to facilitate the opening of the vessel along the strip, said method comprising forming in a portion of said vessel designated for placement of the pre-stressed strip, an annular tensile stress zone solely by thermal treatment of said zone, and thereafter forming in said tensile stress zone a short compressive stress zone solely by thermal treatment of a short section of said tensile stress zone.

4,898,606

PHOSPHORYLAMINOPHENYLTRIAZOLINONE HERBICIDES

George Theodoridis, Princeton, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 258,292, Oct. 14, 1988, abandoned. This application Mar. 7, 1989, Ser. No. 319,842

Int. Cl.[4] A01N *57/32*; C07F *9/65*

U.S. Cl. 71—86 **21 Claims**

1. A compound of the formula

in which

X and Y are independently F, Cl, or Br;

R is lower alkyl or lower haloalkyl;

R^1 is selected from lower alkyl, lower haloalkyl, cycloalkyl of 3 to 7 ring carbon atoms, lower alkenyl, lower haloalkenyl, lower alkynyl, lower haloalkynyl, and benzyl which is unsubstituted or substituted on the phenyl ring with one or more substituents selected from halogen, lower alkyl, lower alkoxy, lower alkoxycarbonyl, cyano, and nitro;

R^2 is independently selected from among —OR^1 or is hydroxy, amino, lower alkylamino, or lower dialkylamino;

R^3 is H, lower alkyl, or lower alkenyl; or a base addition salt of the compound as defined above in which R^2 is hydroxy.

20. A herbicidal composition comprising an herbicidally effective amount of the compound of claim 1 in admixture with a suitable carrier.

4,898,607

HERBICIDAL IMIDAZOLE DERIVATIVES

Henry Szczepanski, Wallbach, Switzerland, and Lourens Wals, Turnhout, Belgium, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

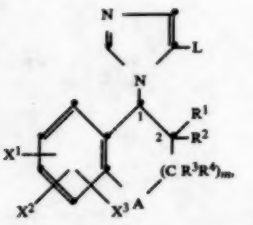
Filed Aug. 18, 1988, Ser. No. 234,240

Claims priority, application Switzerland, Aug. 25, 1987, 3242/87

Int. Cl.[4] A01N *43/50*; C07D *233/90*

U.S. Cl. 71—92 22 Claims

1. A 1,5-substituted imidazole derivative of formula I

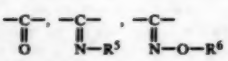


(I)

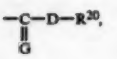
or a stereochemically isomeric form thereof, or a salt thereof, in which

m is 0 or 1,

A is a group



L is



X^1 is hydrogen, C_1–C_5alkyl, C_1–C_5alkoxy, halogen, C_2–C_5alkenyl, nitro, amino, C_1–C_5alkylcarbonylamino, trifluoromethyl or difluoromethoxy,

X^2 is hydrogen, C_1–C_5alkyl, halogen or C_1–C_5alkoxy,

X^3 is hydrogen or halogen, each of R^1 and R^2, independently of the other, is hydrogen, C_1–C_5alkyl or C_2–C_5alkenyl, or

R^1 and R^2 together with the carbon atom carrying them form a spirocyclic C_3–C_7cycloalkane ring,

R^3 is hydrogen, C_1–C_5alkyl, halogen, C_1–C_5alkoxy or hydroxy,

R^4 is hydrogen, C_1–C_5alkyl, halogen or C_1–C_5alkoxy, or

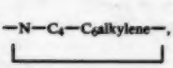
R^3 and R^4 together with the carbon atom carrying them form a carbonyl group, or

R^2 and R^3 are a C_2–C_5alkylene bridge; each of R^5 and R^6 is hydrogen, C_1–C_5alkyl, —CH_2—C_2—C_5alkenyl, benzyl or phenyl,

each of R^{14} and R^{15}, independently of the other, is hydrogen or C_1–C_5alkyl,

G is oxygen or sulfur

D is oxygen or sulfur and R^{20} is hydrogen, C_1–C_5alkyl, —CH_2—C_2—C_5alkenyl, —CH_2—C_2—C_6alkynyl, C_3–C_7cycloalkyl, or C_1–C_5alkyl substituted by C_3–C_7cycloalkyl, C_3–C_7cycloalkoxy, phenyl, C_1–C_5alkoxy, hydroxy, cyano,



carboxy or by C_1–C_5alkoxycarbonyl.

18. A method of controlling weeds, which comprises treating the weeds or the locus thereof with a herbicidally effective amount of a compound of formula I, according to claim 1.

4,898,608

PYRIDYLTHIO-ACYLANILIDE HERBICIDES

Klaus Sasse, Bergisch-Gladbach; Reiner Fischer, Monheim; Hans-Joachim Santel, Leverkusen, and Robert R. Schmidt, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

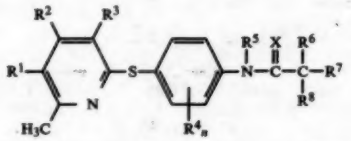
Filed Apr. 15, 1987, Ser. No. 38,700

Claims priority, application Fed. Rep. of Germany, May 2, 1986, 3614846

Int. Cl.[4] C07D *213/57, 213/64*; A01N *43/40*

U.S. Cl. 71—94 9 Claims

1. A pyridylthio-acetanilide of the formula



in which

R^1, R^2 and R^3, independently of one another, represent hydrogen, fluorine, chlorine, bromine, cyano or trifluoromethyl, or alkyl, alkoxy or alkylthio having 1 to 4 carbon atoms in each case,

R^4 represents fluorine, chlorine, bromine, methyl or methoxy,

n represents a number 0, 1 or 2,

R^5 represents hydrogen, or alkyl having 1 to 4 carbon atoms, or alkenyl or alkinyl having 2 to 6 carbon atoms in each case,

R^6 represents hydrogen, fluorine, chlorine, bromine, cyano, alkyl, having 1 to 4 carbon atoms, which is optionally mono- or polysubstituted identically or differently by fluorine, chlorine or bromine, alkenyl having 2 to 4 carbon atoms, phenyl or benzyl which are in each case optionally mono- to pentasubstituted identically or differently by fluorine, chlorine, bromine, trifluoromethyl, methyl and methoxy, or represent the —OR^{12} or —$S(O)_m$—R^{12} radicals, where

R^{12} represents alkyl having 1 to 4 carbon atoms which is optionally mono- or polysubstituted identically or differently by fluorine, chlorine, bromine, methoxy or ethoxy, or represent phenyl which is optionally mono- to pentasubstituted identically or differently by fluorine, chlorine, bromine or C_1–C_4alkyl,

m represents a number 0, 1 or 2,

R^7 ad R^8, independently of one another, represent fluorine, chlorine, bromine or alkyl having 1 to 4 carbon atoms which is optionally mono- or polysubstituted identically or differently by fluorine, chlorine or bromine,

X represents oxygen or sulphur.

8. A method of combating unwanted vegetation which comprises applying to such vegetation or to a locus from which it is desired to exclude such vegetation a herbicidally effective amount of a compound according to claim 1.

4,898,609

4-CYANO-4-(FLUOROPHENYL)-3-(SUBSTITUTED PHENYL) BUTYRIC ACIDS, ESTERS AND DERIVATIVES THEREOF, AND A METHOD OF SELECTIVELY CONTROLLING UNDESIRABLE VEGETATION IN RICE THEREWITH

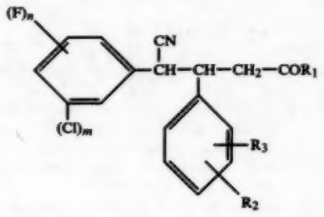
Stephen S. Szucs, Trenton, N.J.; Laura S. Quakenbush, Yardley, Pa., and Pierre A. Marc, Willingboro, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 928,077, Nov. 6, 1986, abandoned. This application Oct. 9, 1987, Ser. No. 104,901

Int. Cl.[4] A01N *43/08, 37/34;* **C07D** *307/46;* **C07C** *121/66*

U.S. Cl. 71—105 **38 Claims**

21. A method for selectively controlling undesirable vegetation in transplanted rice comprising applying to flood water or soil as a preemergence post-transplant or pre-plant incorporated treatment, a herbicidally effective amount of an erythro/threo mixture of a compound of formula I



(I)

wherein R_1 is OH, OR_4 or OM, benzyloxy C_1–C_3 alkyl; R_2 is hydrogen, o-fluorine, m-fluorine, m-chlorine, m-bromine or m-OCH_3; R_3 is hydrogen, p-fluorine, p-OCH_3 or p-CH_3; provided that R_2 and R_3 are not both hydrogen; n is an integer of one or two; m is zero or one; R_4 is C_1–C_3 alkyl, C_1–C_4 alkoxy C_1–C_2 alkyl, furfuryl or benzyl; M is an alkali metal, C_1–C_3 mono or dialkylammonium and the stereoisomers thereof.

4,898,610

CYCLOHEXANE-1,3-DIONE DERIVATIVES AND THEIR USE FOR CONTROLLING UNDESIRABLE PLANT GROWTH

Michael Keil, Freinsheim; Dieter Jahn, Edingen-Neckarhausen; Rainer Becker, Bad Duerkheim; Wolfgang Rohr, Wachenheim, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

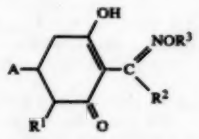
Continuation of Ser. No. 639,473, Aug. 10, 1984, abandoned. This application Jan. 5, 1987, Ser. No. 4,217

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1983, 3329017

Int. Cl.[4] A01N *33/04*

U.S. Cl. 71—121 **10 Claims**

1. A cyclohexane-1,3-dione derivative of the formula



(I)

where A is phenyl monosubstituted in the para-position by trifluoromethyl, by fluorine-substituted C_1–C_3-alkoxy or by C_3–C_5-alkynyloxy, R^1 is hydrogen, methoxycarbonyl, ethoxycarbonyl, methyl or cyano, R^2 is C_1–C_4-alkyl, and R^3 is C_1–C_3-alkyl, C_3- or C_4-alkenyl, C_3- or C_4-haloalkenyl having 1, 2 or 3 halogen substituents, or propargyl, or a salt thereof.

6. A herbicide containing inert additives and a herbicidally effective amount of a cyclohexane-1,3-dione derivative of the formula I, or a salt thereof, as defined in claim 1.

4,898,611

POLYMERIC ORE AGGLOMERATION AIDS

Anthony E. Gross, St. Charles, Ill., assignor to 501 Nalco Chemical Company, Naperville, Ill.

Continuation-in-part of Ser. No. 176,128, Mar. 31, 1988, abandoned. This application Dec. 16, 1988, Ser. No. 285,408

Int. Cl.[4] C27B *1/14*

U.S. Cl. 75—3 **3 Claims**

1. An improved process for heap leaching precious metal ores containing gold and silver wherein the ore fines are first agglomerated with an agglomeration agent, formed into a heap and then leached by percolating through the heap a cyanide solution which extracts the gold and silver from the agglomerated ore for subsequent recovery, the improvement in which the agglomerating agent comprises an anionic water-soluble vinyl addition polymer having a molecular weight of at least 1,000,000, selected from the group consisting of: polyacrylamide; a copolymer of acrylamide and sodium acrylate; polyacrylamide containing sulfonate groups; and a polymer of acrylamide and sodium acrylate copolymer containing sulfonate groups with 5 to 20 pounds per ton of cement, based on the weight of the ore.

4,898,612

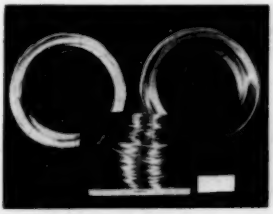
FRICTION-ACTUATED EXTRUSION OF RAPIDLY SOLIDIFIED HIGH TEMPERATURE AL-BASE ALLOYS AND PRODUCT

Paul S. Gilman, Suffern, N.Y., and Michael S. Zedalis, Randolph, N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Aug. 31, 1988, Ser. No. 238,790

Int. Cl.[4] B22F *1/00*

U.S. Cl. 75—249 **14 Claims**



1. A friction-actuated extrusion process in which a continuous friction-actuated extruder has, as in-feed, a particulate that has not been outgassed, said particulate having been comminuted from rapidly solidified aluminum alloy ribbon.

4,898,613

RARE EARTH ALLOY POWDER USED IN PRODUCTION OF PERMANENT MAGNETS

Naoyuki Ishigaki, Otsu; Takaki Hamada, Takatsuki, and Setsuo Fujimura, Kyoto, all of Japan, assignors to Sumitomo Special Metals Co. Ltd., Osaka, Japan

Division of Ser. No. 832,890, Feb. 26, 1985, Pat. No. 4,769,063. This application Jan. 20, 1988, Ser. No. 145,982

Int. Cl.[4] B22F 1/00

U.S. Cl. 75—251 9 Claims

1. A rare earth alloy powder having a particle size in the range of 20 μm to 1 mm and produced by a reduction-diffusion treatment with calcium, consisting essentially of:

25–40 atomic % R_1,

35–83 atomic % Fe, and

2–15 atomic % B,

wherein R_1 represents at least one rare earth element selected from the group consisting of Tb, Dy, Ho, Er, Tm and Yb; and wherein oxygen is at most 7000 ppm, carbon is at most 1000 ppm and calcium is present in an amount not greater than 2000 ppm.

4,898,614

WATER SHEETING ZWITTERIONOMERIC AMINOFUNCTIONAL SILOXANES

Daniel J. Halloran, Midland; Kenneth A. Kasprzak, Saginaw Township, Saginaw County, both of Mich.; Stefano G. Savastano, Somerset, N.J., and Terence J. Swihart, Essexville, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jan. 5, 1989, Ser. No. 293,842

Int. Cl.[4] C08G 77/04; C07F 7/04

U.S. Cl. 106—3 20 Claims

1. In a polish formulation containing as components thereof at least one member selected from the group consisting of waxes, solvents, surfactants, thickening agents, abrasives, dyes, odorants, and other ingredients normally used in making polishes, the improvement comprising incorporating therein a composition which is a zwitterion and the reaction product of an acid anhydride and an aminofunctional siloxane selected from the group consisting of (A) a combination of a hydroxyl endblocked polydimethylsiloxane having a viscosity in the range of about 10 to 15,000 cs at twenty-five degrees centigrade, and a silane selected from the group consisting of those having the general formulae $R''_n(R'O)_{3-n}Si(CH_2)_3NHR'''$ and $R''_n(R'O)_{3-n}SiRNHCH_2CH_2NH_2$ wherein R''' is a hydrogen atom or a methyl radical, R'' is a monovalent hydrocarbon radical free of aliphatic unsaturation and contains from one to six carbon atoms, n has a value of from zero to two, R' is an alkyl radical containing from one to four carbon atoms, and R is a divalent hydrocarbon radical free of aliphatic unsaturation and contains three to four carbon atoms, (B) a combination of a hydroxyl endblocked polydimethylsiloxane having a viscosity in the range of about 10 to 15,000 cs at twenty-five degrees centigrade, a silane selected from the group consisting of those having the general formulae $(R_1O)_3—SiR_2NHR_3$ and $(R_1O)_3—SiR_2NHCH_2CH_2NH_2$ wherein R_1 is an alkyl radical containing from one to four carbon atoms, R_2 is a divalent hydrocarbon radical free of aliphatic unsaturation and contains from three to four carbon atoms, and R_3 is selected from the group consisting of the hydrogen atom and the methyl radical, and a silane having the general formula X_3SiZ wherein X is selected from the group consisting of alkoxy and acyloxy radicals containing from one to four carbon atoms, and Z is a nonhydrolyzable radical selected from the group consisting of hydrocarbon radicals, halogenated hydrocarbon radicals, and radicals composed of carbon, hydrogen, and oxygen atoms, wherein the oxygen atoms are present in hydroxyl groups, ester groups, or ether linkages, there being from one to ten carbon atoms in the Z radical, and (C) a combination of a polydimethylsiloxane having a viscosity in the range of about one to 15,000 cs at twenty-five degrees centigrade, and a silane selected from the group consisting of those having the general formulae $R''_n(R'O)_{3-n}Si(CH_2)_3NHR'''$ and $R''_n(R'O)_{3-n}SiRNHCH_2CH_2NH_2$ wherein R''' is a hydrogen atom or a methyl radical, R'' is a monovalent hydrocarbon radical free of aliphatic unsaturation and contains from one to six carbon atoms, n has a value of from zero to two, R' is an alkyl radical containing from one to four carbon atoms, and R is a divalent hydrocarbon radical free of aliphatic unsaturation and contains three to four carbon atoms.

4,898,615

METHOD OF MANUFACTURING CEMENT

Fernando Trivino Vazquez, Madrid, Spain, and Roger J. Clenin, Puplinge, Switzerland, assignors to Catrel S.A. Societe D'Etudes et D'Applications Industrielle, Geneva, Switzerland

Filed Dec. 28, 1987, Ser. No. 138,160

Claims priority, application Switzerland, Mar. 12, 1987, 933/87

Int. Cl.[4] C04B 7/04, 7/06

U.S. Cl. 106—103 13 Claims

1. A method for manufacturing cement, comprising the steps of:

(a) preparing a homogenous powder mixture from (i) crushed refuse being substantially free of metal constituents, containing water and containing a significant percentage of combustible materials, and (ii) at least one first mineral material containing calcium oxide in the free or combined state, wherein said powder mixture comprises greater than 50% by weight refuse and less than 50% by weight of said first mineral material;

(b) granulating the powder mixture under pressure, whereby granules are produced;

(c) heat treating the granules at a temperature between about 130° and 230° C. for a length of time sufficient to bring the water content of the granules to between about 0.1 and 1.0% by weight, whereby a heat-treated refuse product is produced;

(d) mixing the heat-treated refuse product with a components selected from the group consisting of a mixture of limestone and clay and a mixture of silica, lime, alumina and iron oxides, and firing the resulting mixture in a kiln, whereby a clinker is produced; and

(e) adding gypsum to said clinker and crushing the resulting mixture, whereby cement is produced.

4,898,616

AQUEOUS ADDITIVE SYSTEMS, METHODS AND POLYMERIC PARTICLES

Kenneth W. Hyche, and William C. Gose, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 701,888, Feb. 15, 1985, abandoned. This application Feb. 7, 1986, Ser. No. 827,042

Int. Cl.[4] C08L 91/06; C09D 3/393

U.S. Cl. 106—271 4 Claims

1. Aqueous application system for applying additives to polymeric particles, the system being characterized by freedom from in situ formation of color producing complexes, said system comprising about 2 to about 10 percent by weight of a surfactant, about 5 to about 20 percent by weight of an emulsified wax, about 0.2 to about 1.0 percent by weight of a base with a pH in the range of greater than 7 to equal to or less than 10.5, about 20 to about 60 percent by weight of at least one additive capable of forming color producing complexes, and about 40 to about 60 percent by weight of water.

4,898,617

WORKING MATERIAL FOR CONSTRUCTION OR REPAIR

Masatoshi Motomura, Ichihara; Ichiro Muramatsu, Chiba; Noboru Okoshi, Sodegaura; Yoshitami Araki, Kisai; Kenichiro Nomura, Satte; Takehisa Kozai, Kodaira, and Hiroshi Mita, Hiroshima, all of Japan, assignors to Dainippon Ink & Chemicals, Inc. and Taisei Road Construction Co., Ltd., both of Tokyo, Japan

Filed Sep. 28, 1988, Ser. No. 250,162

Claims priority, application Japan, Sep. 28, 1987, 62-240885

Int. Cl.[4] C08L *95/00*

U.S. Cl. 106—281.1 16 Claims

1. A working material for construction or repair comprising (A) a mixture of 0.5 to 30% by weight of (a-1) a hydroxide of a divalent or higher basic metal, 10 to 99% by weight of (a-2) an aggregate and 0.5 to 70% of (a-3) a bituminous substance, the total amount of these materials (a-1), (a-2) and (a-3) being 100% by weight, and covering the mixture (A), (C) oxidized rosin whereby a chelating reaction between the metal hydroxide (a-1) in mixture (A) and the oxidized rosin (C) is effectively inhibited.

4,898,618

PAINTABLE COMPOSITION FOR PROTECTING METALS AND CERAMICS DURING THERMAL TREATMENT

Cressie E. Holcombe, Jr., Knox County, and Lloyd R. Chapman, Anderson County, both of Tenn., assignors to ZTP Coatings, Oak Ridge, Tenn.

Filed Jun. 10, 1988, Ser. No. 205,090

Int. Cl.[4] C09K *15/02*

U.S. Cl. 106—287.34 16 Claims

1. A paintable composition for producing, when dry, a coating for metal and ceramic substrates to inhibit oxidation, decarburization and similar deleterious reactions when said substrates are exposed to elevated temperatures, said composition consisting essentially of:

about 12–83 wt % aqueous-silica-containing liquid having about 27±9 wt % silica;

about 6–57 wt % R_2O aqueous solution, where R is selected from Na, K, Li and mixtures thereof; and

about 8.0–53.5 wt % of at least one transition metal component selected from the oxides and precursors of oxides of cobalt, chromium, iron, manganese, nickel, titanium, zinc and zirconium, based on the total weight of the composition.

4,898,619

PIGMENT COMPOSITIONS

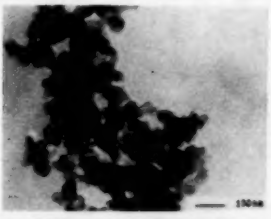
John F. Clifford, Buckinghamshire, and Fiona C. R. Morrison, Cheshire, both of United Kingdom, assignors to Cookson Group PLC, United Kingdom

Filed Dec. 19, 1988, Ser. No. 286,142

Claims priority, application United Kingdom, Dec. 21, 1987, 8729729

Int. Cl.[4] C09C *1/22*

U.S. Cl. 106—459 19 Claims



7. A pigment which consists essentially of crystallites of iron oxide having an average particle size of less than 100 nanometers doped with from 10% to 80% by weight of aluminium as Al^{3+} based on the weight of iron, having the general formula $(Al_xFe_{2-x})O_3$, where x=0.34 to 1.24 and having an orange colour with the following colour measurements:

L (Lightness) >45°

C (Strength) >40°

H (Hue) 50° to 60°

4,898,620

DRY GROUND/WET GROUND CALCIUM CARBONATE FILLER COMPOSITIONS

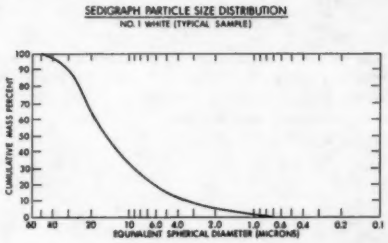
Jerry W. Rayfield, Sylacauga, Ala.; Robert Baker, Marietta, Ga., and Kenneth E. Weber, Pacific Palisades, Calif., assignors to ECCA Calcium Products, Inc., Atlanta, Ga.

Division of Ser. No. 231,391, Aug. 12, 1988, Pat. No. 4,835,195.

This application May 16, 1989, Ser. No. 352,726

Int. Cl.[4] C08K *7/00*

U.S. Cl. 106—464 10 Claims



1. A finely-divided particulate composition comprising a mixture of:

A. Dry-ground calcium carbonate wherein the particles present range in median particle size from about 5 μm to about 30 μm in equivalent spherical diameter and whose particle size distribution is such that:

(a) no more than about 10 weight percent of the particles present are greater than about 80 μm in equivalent spherical diameter;

(b) at least about 10 weight percent of the particles present are less than about 10 μm in equivalent spherical diameter;

(c) at least about 5 weight percent of the particles present are less than about 5 μm in equivalent spherical diameter; admixed with

B. wet-ground calcium carbonate having the following characteristics:

(a) the size of the mineral particles at the 50% point on a SediGraph particle size distribution curve representing the wet ground material is from about 0.6 μm to about 2.0 μm in equivalent spherical diameter;

(b) the size of the mineral particles at the 80% point on said distribution curve divided by the size of the mineral particles at the 50% point on said distribution curve gives a number of from about 1.3 to about 2.8;

(c) the size of the mineral particles at the 20% point on said distribution curve is from about 0.2 μm to about 1.5 μm in equivalent spherical diameter; and the overall sizes of mineral particles present are such that:

no more than about 2 weight percent of the particles present are larger than about 10 μm in equivalent spherical diameter;

at least about 97 weight percent of the particles present are less than about ∂μm in equivalent spherical diameter;

at least about 90 weight percent of the particles present are less than about 5.5 μm in equivalent spherical diameter;

at least about 70 weight percent of the particles present are less than about 3 μm in equivalent spherical diameter;

at least about 20 weight percent of the particles present are less than about 1.5 μm in equivalent spherical diameter; and

no more than about 40 weight percent of the particles present are less than about 0.4 μm in equivalent spherical diameter.

4,898,621

USE OF HYDROXYALKYL POLYETHYLENE GLYCOL ETHERS AS SURFACTANTS IN RINSE AIDS FOR DISHWASHING MACHINES

Horst Pruehs; Gilbert Schenker, Erkrath; Theodor Altenschoepfer, Duesseldorf, and Robert Piorr, Ratingen-Hoesel, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

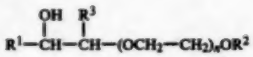
Filed Jul. 15, 1988, Ser. No. 220,142

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1987, 3723873

Int. Cl.[4] C11D *1/72, 3/20*

U.S. Cl. 134—25.2 10 Claims

1. The process of rinsing dishes and glassware in a dishwashing machine comprising adding thereto a rinse aid composition containing a hydroxyalkyl polyethylene glycol ether corresponding to the following formula



(I)

in which

R^1 is hydrogen or a linear C_1–C_{16} alkyl radical,

R^2 is a linear or branched C_4–C_8 alkyl radical,

R^3 is hydrogen or a C_1–C_{16} alkyl radical and

n is a number of from about 7 to about 30,

with the proviso that the total number of carbon atoms in R^1 and R^3 is from about 6 to about 16, and mixtures of said ether.

4,898,622

ORNAMENTAL ALLOY MATERIAL AND METHOD

Takashi Kuze, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Continuation of Ser. No. 214,336, Mar. 11, 1981, abandoned. This application May 5, 1983, Ser. No. 490,982

Claims priority, application Japan, Dec. 14, 1979, 54-161432

Int. Cl.[4] C22F *1/10*

U.S. Cl. 148—2 9 Claims

1. A process for preparing a nickel-chromium alloy including silver comprising the steps of preparing an ingot of the alloy mixture, consisting essentially of about 5 to about 20 weight percent chromium, about 0.3 to about 10 weight percent silver and the remainder is nickel, warm rolling the ingot at a temperature ranging from about 300 degrees to about 400 degrees Centigrade to form a billet where the cross-sectional reduction per pass is not greater than 20% and thereafter cold rolling the billet into a bar having a diameter ranging from about 2 to about 4 mm with the cross-sectional reduction being in excess of 80%.

4,898,623

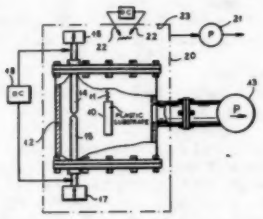
METHOD OF SHAPING HARD DIFFICULT-TO-ROLL ALLOYS

Eduard Pinkhasov, Eastchester, N.Y., assignor to Vapor Technologies Inc., Mt. Vernon, N.Y.

Filed Dec. 9, 1988, Ser. No. 282,609

Int. Cl.[4] B22D *23/00*; C22F *1/18*

U.S. Cl. 148—3 18 Claims



1. A method of making objects from difficult-to-roll alloys, comprising the steps of:

(a) depositing upon a synthetic resin substrate having a shape complementary to a shape to be imparted to a difficult-to-roll alloy, a layer of said alloy of approximately a final thickness of an object of said shape to be fabricated from said alloy, by striking an arc between electrodes at least one of which is constituted of at least one metal of said alloy in an evacuated space to form a vapor of the composition of said alloy and depositing said layer from said vapor on said substrate, whereby the composition of said layer is substantially true to the composition of said vapor;

(b) removing said layer from said substrate; and

(c) heat-treating the layer removed from said substrate to increase the density of said layer.

4,898,624

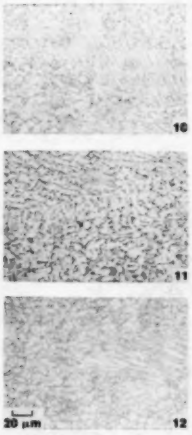
HIGH PERFORMANCE TI-6A1-4V FORGINGS

Amiya K. Chakrabarti, Monroeville, Pa.; George W. Kuhlman, Jr., Pepper Pike, and Stanley R. Seagle, Warren, both of Ohio, assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jun. 7, 1988, Ser. No. 203,691

Int. Cl.[4] C22F *01/18*

U.S. Cl. 148—11.5 F 11 Claims



1. An alloy comprising:

5.5 to 6.75% Al,

3.5 to 4.5% V,
0.1 to 0.2% O,
0.02 to 0.05% N,
≦0.3% Fe,
0 to ≦0.08% C,
0 to ≦0.0125% H,
0 to ≦0.005 Y,
residual elements each 0 to ≦0.1%
total 0 to ≦0.4%, and the remainder Ti wherein the microstructure comprises nearly equiaxed primary alpha particles with platelets of secondary alpha in an aged beta matrix and wherein the fracture toughness (K_{Ic}) is at least about 45 ksi-(in)$^{\frac{1}{2}}$.

4,898,625

METHOD FOR PRODUCING A RARE EARTH METAL-IRON-BORON PERMANENT MAGNET BY USE OF A RAPIDLY-QUENCHED ALLOY POWDER

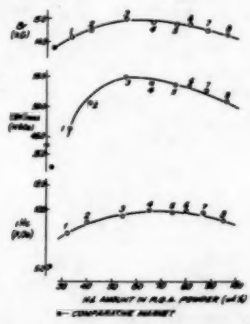
Tsutomu Otsuka, and Etsuo Otsuki, both of Miyagi, Japan, assignors to Tokin Corporation, Miyagi, Japan

Division of Ser. No. 97,656, Sep. 16, 1987. This application Apr. 11, 1989, Ser. No. 336,207

Claims priority, application Japan, Sep. 16, 1986, 61-217629; Jan. 30, 1987, 62-18707; Apr. 9, 1987, 62-85676; Apr. 11, 1987, 62-87917; May 18, 1987, 62-120826

Int. Cl.[4] H01F 1/02

U.S. Cl. 148—101 22 Claims



1. A method for producing a transition metal-rare earth metal-boron permanent magnetic body with a high energy product and a reduced oxygen content, said permanent magnet body comprising a solid solution phase and magnetic crystalline particles dispersed within said solid solution phase, which comprises steps of:

preparing an ingot of R—T—B magnetic alloy comprising a magnetic intermetallic compound represented by a chemical formula of $R_2T_{14}B$, where R is at least one element selected from the group consisting of yttrium (Y) and rare earth metals, T is at least one transition metal comprising 50–100 at % iron on the basis of the total transition metal;

pulverizing and milling said ingot to thereby prepare a magnetic alloy powder;

preparing a rapidly quenched alloy body by rapidly quenching a melt comprising at least one metal element (R) selected from the group consisting of yttrium (Y) and rare earth metals and at least one of boron (B) and a transition metal (T);

pulverizing and milling said rapidly quenched alloy body to thereby produce a rapidly-quenched alloy powder;

mixing said rapidly-quenched alloy powder with said magnetic alloy powder to provide a mixed powder containing said rapidly quenched alloy powder in an amount of 70% or less by volume;

compacting said mixed powder into a compact body of a desired shape; and

liquid sintering said compact body at an elevated liquid sintering temperature to produce the permanent magnetic body wherein said rapidly-quenched alloy powder melts to a liquidus phase which cements the magnetic alloy powder and a part of the liquidus phase substantially generates the magnetic crystalline particles and the remaining portion of the liquidus phase generates the solid solution phase upon cooling from the liquid sintering temperature.

4,898,626

ULTRA-RAPID HEAT TREATMENT OF GRAIN ORIENTED ELECTRICAL STEEL

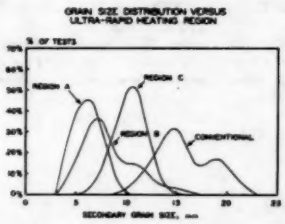
Jerry W. Shoen, and David E. Margerum, both of Middletown, Ohio, assignors to Armco Advanced Materials Corporation, Lyndora, Pa.

Filed Mar. 25, 1988, Ser. No. 173,698

The portion of the term of this patent subsequent to Feb. 6, 2007, has been disclaimed.

Int. Cl.[4] H01F 1/04

U.S. Cl. 148—111 8 Claims



1. A process for controlling secondary grain growth and improving the magnetic properties of grain oriented electrical steel strip containing less than 6.5% silicon, said process comprising the steps of subjecting said strip of final gauge to an ultra-rapid annealing treatment at a heating rate above 100° C. per second (180° F. per second) to a temperature above 675° C. (1250° F.), decarburizing and subjecting said strip to a final high temperature anneal for secondary growth, whereby said strip has secondary grains of reduced size a degree of texturing above 90% in the (110)[001] direction and improved core loss, which improvement will survive a stress relief annealing without any significant change in magnetic properties.

4,898,627

ULTRA-RAPID ANNEALING OF NONORIENTED ELECTRICAL STEEL

Jerry W. Schoen, Middletown, Ohio, assignor to Armco Advanced Materials Corporation, Lyndora, Pa.

Filed Mar. 25, 1988, Ser. No. 173,695

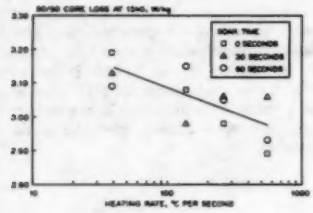
Int. Cl.[4] H01F 1/04

U.S. Cl. 148—111 13 Claims

1. A method for annealing nonoriented electrical steel strip which comprises:

a. heating said strip at a rate above 133° C. per second.

b. heating said strip to a peak temperature of from 750° C. to 1150° C., and



c. soaking said strip for a period less than five minutes within said peak temperature range.

4,898,628

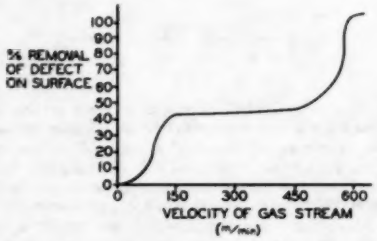
HOT WORKING METHOD FOR PRODUCING GRAIN ORIENTED SILICON STEEL WITH IMPROVED GLASS FILM FORMATION

Wayne F. Block, Waukesha, Wis.; Wade S. Wright, Fairfield, Ohio, and Chris G. Klapheke, Gibsonia, Pa., assignors to Armco Advanced Materials Corporation, Lyndora, Pa.

Filed Jan. 19, 1989, Ser. No. 299,714

Int. Cl.[4] H01F *1/04*

U.S. Cl. 148—111 16 Claims



11. A method of improving the surface of cold rolled oriented silicon steel for improved adherence of an insulative coating comprising the steps of:

(a) heating a slab of oriented silicon steel in a hearth furnace to a temperature of 1260° to 1400° C.,

(b) subjecting said slab to an oxidizing treatment after exiting said furnace with a gas having at least 30% oxygen and a velocity of at least 460 meters/minute for at least one second,

(c) removing the scale formed during said oxidizing treatment,

(d) hot rolling said slab to form a hot rolled strip,

(e) annealing said hot rolled strip,

(f) cold rolling in one or more stages said annealed strip,

(g) decarburizing said cold rolled strip and providing a continuous surface of fayalite,

(h) applying an annealing separator and

(i) providing a final high temperature anneal to develop the magnetic properties of the oriented silicon steel and form a continuous glassy coating.

4,898,629

METHOD OF PRODUCING HOT ROLLED STEEL STRIP

Cestmir Lang, Oberhausen, and Lutz Meyer, Voerde, both of Fed. Rep. of Germany, assignors to Thyssen Stahl AG, Duisburg, Fed. Rep. of Germany

Filed Jun. 20, 1988, Ser. No. 209,256

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1987, 3721641

Int. Cl.[4] C21D *8/02*

U.S. Cl. 148—12 B 9 Claims

1. A method of producing a hot rolled strip having a tensile strength of Rm=500 to 780 N/mm^2 from an unalloyed or low-alloy steel having 0.3 to 0.9% C, comprising austenizing a steel slab, hot rolling the slab into a hot rolled strip, cooling the strip on a run-out table and winding the strip into a coil, wherein the hot rolling and cooling of the hot rolled strip on the run-out table are controlled such that the austenite/ferrite transformation in the hot rolled strip starts only in the coil and is finished in the coil.

4,898,630

THERMOSETTING HIGHLY FOAMING SEALER AND METHOD OF USING IT

Osamu Kitoh, Nagoya, and Masahiko Ohashi, Inazawa, both of Japan, assignors to Toyota Jidosha Kabushiki and Iida Industry Co., Ltd., Japan

Filed Nov. 17, 1988, Ser. No. 272,285

Claims priority, application Japan, Nov. 18, 1987, 62-291550; Dec. 25, 1987, 62-331714

Int. Cl.[4] B32B *31/26, 31/30, 5/20*

U.S. Cl. 156—79 21 Claims

20. A process for filling a gap formed between two parallel planes comprising the steps of:

a first step of providing a thermosetting highly foaming sealer containing an unvulcanized rubber, a vulcanizing agent, a softener and an inorganic filler and comprising a first sealing member bonded on one of two parallel planes before heating and a second sealing member laminated on said first sealing member; and

a second step of vulcanizing, foaming and expanding said first sealing member from 1 to 2 times of original volume thereof and said second sealing member 6 times or more of original volume thereof by heating, thereby filling said gap with said thermosetting highly foaming sealer.

4,898,631

METHOD FOR FABRICATING CERAMIC FILAMENTS AND HIGH DENSITY TAPE CASTING METHOD

Earl R. Collins, Jr., La Canada, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Jan. 15, 1988, Ser. No. 144,407

Int. Cl.[4] B28B *1/20*; B29B *9/06*

U.S. Cl. 156—89 21 Claims

1. A method of forming a mat of overlying sinuous filaments having a predetermined thickness comprising:

(a) blending a mixture comprising

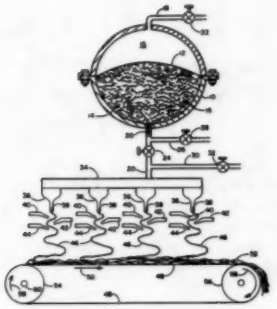
(i) finely divided solid particles,

(ii) a binder operable for bonding said solid particles together, and

(iii) a solvent for said binder, into an uniformly dispersed slurry;

(b) transforming said slurry into a plurality of downwardly falling filaments;

(c) deflecting said plurality of downwardly falling filaments with a plurality of impinging gas streams operative for deflecting and bending said filaments into a plurality of



downwardly falling sinuous filaments while simultaneously removing said solvent therefrom by evaporation; and

(d) collecting said plurality of sinuous filaments on a moving surface in such a manner that said plurality of sinuous filaments overlap each other a predetermined amount thereby forming a mat of overlying sinuous filaments having a predetermined thickness.

4,898,632

METHOD OF MANUFACTURING A SAFETY GLASS PANE COMPRISED OF A SHEET OF GLASS AND A SHEET OF FLEXIBLE PLASTIC MATERIAL

Mario Roth; Vordem Esche, both of Aachen, and Heinz Scholl, Eschweiler, all of Fed. Rep. of Germany, assignors to Saint-Gobain Vitrage, Courbevoie, France

Filed Jul. 30, 1984, Ser. No. 635,526

Claims priority, application France, Jul. 28, 1983, 83 12460

Int. Cl.[4] B32B *17/00*

U.S. Cl. 156—99 **10 Claims**

1. A method of manufacturing a laminated glass pane comprised of the following constituent parts: (i) a sheet of glass and, (ii) a sheet or film of flexible plastic material, wherein said sheet or film comprises at least one layer of flexible plastic material, said method comprising:

(i) stacking the constituent parts of at least two curved panes such that a face of each glass sheet which face is not covered by its corresponding plastic sheet or film serves as a counter-mold for the adjoining pane, and whereby a separating means is inserted between each pane;

(ii) applying a final counter-mold over the exposed plastic sheet of said stack;

(iii) subjecting the stacked panes and counter mold to conditions of elevated temperature and pressure.

4,898,633

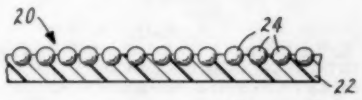
ARTICLE CONTAINING MICROENCAPSULATED MATERIALS

Richard H. Doree, St. Paul, and Josef V. Ugro, Jr., Mahtomedi, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 880,050, Jun. 30, 1986, Pat. No. 4,774,133, which is a continuation of Ser. No. 699,660, Feb. 8, 1985, Pat. No. 4,654,256. This application Jul. 15, 1988, Ser. No. 219,180

Int. Cl.[4] A63B *39/00*

U.S. Cl. 156—145 **3 Claims**



1. Method of applying an article to a porous object, said article comprising:

(A) a thermoplastic polymeric substrate,

(B) on at least one surface of said substrate a layer comprising rupturable microcapsules carrying a liquid therein and a binder resin adhering the microcapsules to the substrate, the surface of said substrate bearing said microcapsules being capable of softening sufficiently when exposed to heat to allow said microcapsules to become partially embedded in said surface by means of applied pressure, said microcapsules being sufficiently strong to avoid rupture when exposed to the heat and pressure required to soften said substrate and embed said microcapsules, said substrate further being capable of softening sufficiently so that the thermoplastic material of the polymeric substrate can flow sufficiently to allow the substrate to become bonded to porous objects, said method comprising the steps of:

(1) placing said article ono said porous object,

(2) subjecting said article to sufficient heat and pressure to partially embed said microcapsules in said substrate and adhere said substrate to said porous object.

4,898,634

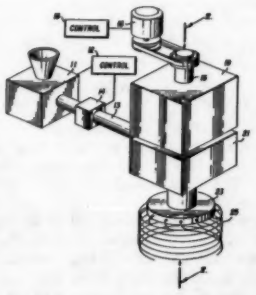
METHOD FOR PROVIDING CENTRIFUGAL FIBER SPINNING COUPLED WITH PRESSURE EXTRUSION

Herbert W. Keuchel, Tallmadge, Ohio, assignor to John E. Benoit, Annandale, Va.

Division of Ser. No. 632,733, Jul. 20, 1984, Pat. No. 4,790,736. This application Jul. 5, 1988, Ser. No. 215,475

Int. Cl.[4] D01D *5/18*

U.S. Cl. 156—167 **17 Claims**



1. A process for forming fibers comprising

supplying a source of molten polymer fiber-forming material;

pumping said fiber-forming material from said source to at

least one spinneret on a rotatable die, said fiber-forming material being pumped under pressure through a substantially leak-proof closed channel connecting said source to said at least one spinneret on said rotatable die;

controlling the extrusion rate of said material through said spinneret by controlling the volumetric quantity of said fiber-forming material being pumped to said at least one spinneret through said channel; and

rotating said die during extrusion of said fiber-forming material;

whereby said molten polymer fiber-forming material is expelled from said spinnerets so as to produce fibers.

4,898,635

METHOD AND APPARATUS FOR BONDING PARTS OF DISAPPEARING MODEL USED FOR CASTING

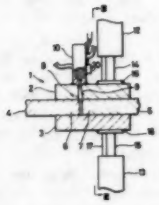
Toshiaki Kobari, Nagano, Japan, assignor to Morikawa Sangyo Kabushiki Kaisha, Nagano, Japan

Filed Oct. 12, 1988, Ser. No. 256,485

Claims priority, application Japan, Oct. 31, 1987, 62-276854

Int. Cl.[4] B29C *45/14*; B32B *31/14*

U.S. Cl. 156—245 **3 Claims**



1. A method of bonding parts of a disappearing model used for casting comprising placing a plurality of parts of a foamable synthetic resin for making a disappearing model in adjacent relationship to each other to form an assembly to be bonded together; surrounding said assembly of parts with an injection mold frame which has been previously formed and has an internal shape that accords with the external shape of said assembly of parts to be bonded; said mold having an injection opening formed therein to allow an adhesive to be injected; by means of an injection nozzle injecting through said injection opening an adhesive between said portions to be adhered by means of an apparatus for injecting said adhesive so as to bond together said portions to be adhered; said external surfaces of said assembly being seated against the internal surfaces of said mold in such a manner that the adhesive is entirely confined to the space between the parts whereby the surfaces of the assembled and bonded parts are smooth; and removing said injection mold frame from said portion after bonding.

4,898,636

MULTILAYER PRINTED WIRING REGISTRATION METHOD AND APPARATUS

Walter S. Rigling, 113 Bridgeview Court, Longwood, Fla. 32779

Filed May 4, 1989, Ser. No. 347,290

Int. Cl.[4] C23F *1/02*; B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—626 **7 Claims**

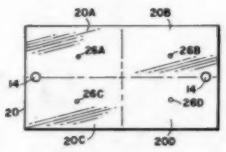
1. A method of registering terminal areas of the substrates of a laminated printed wiring panel; wherein the centers of the terminal areas have shifted from known design locations, for drilling holes therethrough prior to plating of electrical interconnections through the holes comprising the steps of:

(a) drilling, at a point of known design coordinates, a target pilot hole through an interior substrate board of the panel, prior to etching of a printed wiring pattern thereon and prior to lamination of the substrate board in the panel, said pilot hole having a diameter smaller than a terminal area;

(b) inserting a disc of detectable material into the drilled target hole;

(c) etching a printed wiring pattern on the drilled substrate board;

(d) fabricating the laminated multilayer panel with the drilled substrate board and undrilled substrate boards;



(e) detecting the location on the panel of a center of the detectable disc; and

(f) measuring the shift of the center of the pilot hole from the known design coordinates thereof, which shift occurs during etching and fabrication.

4,898,637

PROCESS FOR THE MANUFACTURE OF A TUBULAR SEMIMANUFACTURED ARTICLE MADE FROM PLASTIC FOR THE FABRICATION OF CONTAINER SACKS

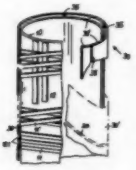
Franz X. Starlinger-Huemer, Sonnenuhrgasse 4, 1060 Vienna, Austria

Filed Nov. 10, 1987, Ser. No. 119,464

Claims priority, application Switzerland, Nov. 11, 1986, 04500/86

Int. Cl.[4] B28B *21/52*

U.S. Cl. 156—172 **1 Claim**



1. A process for the maufacture of a sack, comprising the steps of:

extruding a tubular extrudate composed of a thermoplastic film;

laying longitudinal reinforcement strands in spaced apart relationship along said tubular extrudate;

laying at least two reinforcement strands onto said tubular extrudate and said longitudinal reinforcement strands in helical patterns in spaced-apart turns in opposite senses to form a reinforcement layer thereon extending along and around said tubular extrudate, so that gaps between said turns register with gaps between said longitudinal strands and are throughgoing through said reinforcement layer;

continuously delivering at least one thermoplastic film web from a roll to and winding said at least one film web around said reinforcement layer so that successive web turns have adjoining edges and bonding said adjoining edges together by heating to a soft and warm condition in the vicinity of a heated inner caibrating ring so that said turns from a continuous jacket around said reinforcement layer, said film and said film web being composed of thermoplastic material having melting temperatures below the melting temperatures of said strands;

thermally bonding said jacket through said throughgoing

gaps directly to said tubular extrudate without bonding said jacket to said reinforcement layer to form a tube; and forming a sack from said tube.

4,898,638

METHOD OF MANUFACTURING FLEXIBLE GASKETS WHICH WITHSTAND CHEMICAL AGENTS

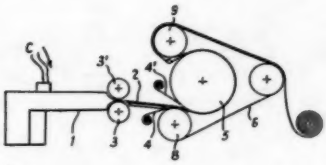
Pierre Lugez, Le Neubourg, France, assignor to Valois S.A., Le Neubourg, France

Filed Nov. 28, 1988, Ser. No. 276,740

Claims priority, application France, Nov. 26, 1987, 87 16427

Int. Cl.[4] B29C *47/06;* **B32B** *25/08, 31/04, 31/28*

U.S. Cl. 156—272.6 **5 Claims**



1. A method of manufacturing a flexible gasket which withstands chemical attack from fluid substances, said method consisting in applying at least one film of PTFE (polytetrafluoroethylene) directly onto a sheet of raw rubber and in subjecting said sheet of rubber together with said film of PTFE to heating and to pressure suitable for causing said rubber to vulcanize, wherein said film of PTFE is previously treated by a corona effect which comprises bombarding said film with a corona discharge on that one of its two faces which comes into contact with said sheet of rubber.

4,898,639

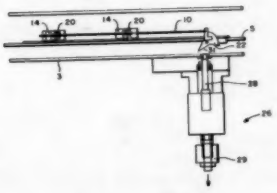
WAFER RETENTION DEVICE

Rolf Moe, Alameda; David J. Correia, Hayward, and Michael Downs, San Jose, all of Calif., assignors to Bjorne Enterprises, Inc., Fremont, Calif.

Filed Apr. 14, 1989, Ser. No. 338,056

Int. Cl.[4] B44C *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—345 **9 Claims**



1. An apparatus for stripping materials from a wafer, the apparatus comprising a housing, an actuator means and a turret rotatably coupled to the housing for rotation about a selected axis, the turret being formed with a plurality of pockets, each pocket being shaped to hold a wafer, the flat surface of a wafer within the pocket defining a wafer surface plane and wherein each pocket includes:

support means disposed about the periphery of the pocket for supporting the retained wafer; and

a latching member pivotally coupled to the turret for rotation about an axis that is substantially parallel to the wafer surface plane at a pivot point spaced apart from the wafer surface plane substantially adjacent the edge of the wafer, the latching member including a cam follower portion for engaging the actuating means, a wafer engaging portion for pressing against the side of a wafer carried by the associated pocket, and biasing means for urging the cam follower towards the engagement position; and

wherein the actuator means is arranged to independently pivot the latching member from an engagement position suitable for contacting a wafer carried by the pocket to a disengaged position free from contacting the wafer.

4,898,640

CABLE SHIELDING TAPE AND CABLES INCORPORATING SUCH TAPE

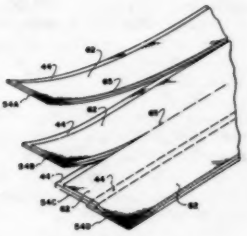
Lawrence J. O'Connor, Winnipeg, Canada, assignor to KT Technologies Inc., Bridgetown, Barbados

Filed Mar. 23, 1988, Ser. No. 172,425

Claims priority, application United Kingdom, Mar. 26, 1987, 8707219

Int. Cl.[4] B65H *18/28*

U.S. Cl. 156—204 **18 Claims**



1. A method of manufacturing tape comprising forwarding a plurality of separate tapes each comprising a layer of an insulating material, laying the tapes as they are forwarded in a pattern each relative to the next so that an edge portion of each tape less than the width of the tape lies over an edge portion of a next adjacent tape, while the tapes remain in the pattern, laminating onto the tapes a layer of a conducting material of a width sufficient to cover more than one of the tapes, separating each of the insulating material tapes from the other insulating material tapes each with a portion of the conducting material laminated thereto covering a surface thereof except for said edge portion which is free from said layer of conducting material, and winding each of the tapes into a cylindrical package.

4,898,641

SINGLE CRYSTAL WAFER OF LITHIUM TANTALATE

Masahiro Ogihara; Shinji Makikawa, and Masaaki Iguchi, all of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

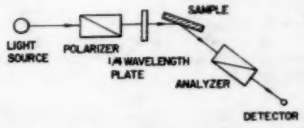
Continuation of Ser. No. 22,591, Mar. 4, 1987, Pat. No. 4,776,917, which is a division of Ser. No. 810,748, Dec. 19, 1985, abandoned. This application Jul. 19, 1988, Ser. No. 221,325

Claims priority, application Japan, Dec. 24, 1984, 59-280820

The portion of the term of this patent subsequent to Oct. 11, 2005, has been disclaimed.

Int. Cl.[4] C30B *29/30, 33/00;* **H01L** *41/01;* **H03H** *9/00*

U.S. Cl. 156—601 **1 Claim**



1. A method of preparing an SAW device having a deviation

in the sound velocity of less than ±0.15% which comprises the steps of: (a) providing the surface of a single crystal wafer of lithium tantalate having a double refraction value of $4.5\times10^{-3}\pm6\times10^{-4}$ and in which the value of the variation of the double refraction value does not exceed $\pm6\times10^{-4}$ measured at a wavelength of 632.8 nm and at a temperature of 20° C.; and (b) forming two patterned electrodes on the surface of the single crystal wafer in a parallel alignment with each other in such an orientation that the direction of propagation of SAW is in parallel.

4,898,642

TWISTED, CHEMICALLY STIFFENED CELLULOSIC FIBERS AND ABSORBENT STRUCTURES MADE THEREFROM

Danny R. Moore, Germantown; James W. Owens, and Howard L. Schoggen, both of Memphis, all of Tenn., assignors to The Procter & Gamble Cellulose Company, Memphis, Tenn.

Continuation of Ser. No. 21,953, Mar. 5, 1987, abandoned, which is a continuation-in-part of Ser. No. 879,671, Jun. 27, 1986, abandoned. This application Feb. 1, 1989, Ser. No. 304,925

The portion of the term of this patent subsequent to Apr. 18, 2006, has been disclaimed.

Int. Cl.[4] D21H *5/12*; D06M *1/00*

U.S. Cl. 162—157.6 **28 Claims**

1. Cellosic fibrous material comprising individualized, chemically stiffened, curled cellulosic fibers and a crosslinking agent, wherein said crosslinking agent is selected from the group consisting of C_2–C_8 dialdehydes, C_2–C_8 dialdehyde acid analoques having at least one aldehyde group, and oligomers of said dialdehydes and dialdehyde acid analogues, said fibers chemically stiffened by reaction with from about 0.75 mole % to about 2.0 mole % of said crosslinking agent, calculated on a cellulose anhydroglucose molar basis, said fibers having:

a. an average dry fiber twist count of at least about 4.5 twist nodes per millimeter;

b. an average wet fiber twist count of at least about 3.0 twist nodes per millimeter and at least about 0.5 twist nodes per millimeter less than said dry fiber twist count;

c. an average isopropyl alcohol retention value of less than about 30%; and

d. an average water retention value of between about 28% and about 50%.

4,898,643

HEADBOX CONTROL APPARATUS FOR A PAPERMAKING MACHINE

Elmer Weisshuhn, Vogt; Alfred Bubik, Ravensburg; Hans Dahl, Ravensburg; Herbert Holik, Ravensburg; Rüdiger Kurtz, Immenstaad; Anton Zembrot, Aulendorf; Wolf-Gunter Stotz, Ravensburg; Werner Seider, Ravensburg, and Robert Tröndle, Ravensburg, all of Fed. Rep. of Germany, assignors to Sulzer-Escher Wyss GmbH, Fed. Rep. of Germany

Filed May 19, 1986, Ser. No. 873,196

Claims priority, application Switzerland, Sep. 19, 1984, 04489/84; Feb. 28, 1985, 00915/85

Int. Cl.[4] D21F *1/06*

U.S. Cl. 162—259 **30 Claims**

1. A headbox apparatus for a papermaking machine defining a predetermined machine direction and a predetermined web width and for producing a paper web from an infed fiber stock suspension passed through the headbox apparatus, said headbox apparatus comprising:

a distribution box for distributing an infed fiber stock suspension across the predetermined web width;

a diffusor system following said distribution box and receiving the infed fiber stock suspension from said distribution box;

said diffusor system possessing a plurality of diffusor channels for throughpassing the infed fiber stock suspension through said diffusor system;

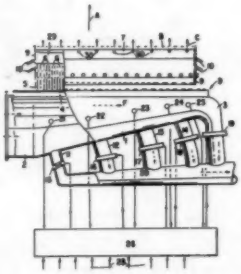
a nozzle chamber following and flow communicating with said diffusor system;

said nozzle chamber receiving said infed fiber stock suspension from said diffusor system;

said nozzle chamber containing a delivery slice defining an adjustable opening width for outfeeding the infed fiber stock suspension;

said nozzle chamber having a predetermined length between said diffusor system and said delivery slice and a predetermined width;

adjusting means for adjusting a predeterminate opening width profile of said adjustable opening width of the



delivery slice of said nozzle chamber and thereby a predeterminate weight per unit area distribution across said predetermined web width; and

control means operatively connected with said adjusting means and for controlling, as a function of the adjustment of said adjusting means, the throughflow of the infed fiber stock suspension through said nozzle chamber in order to substantially equalize said throughflow in terms of flow rate and pressure at least at preselected locations along the predetermined length and across said predetermined width of said nozzle chamber and thereby substantially eliminate transverse flows of the infed fiber stock suspension within the nozzle chamber.

4,898,644

REMOVAL OF VOLATILE ACIDS FROM AQUEOUS SOLUTIONS

Wendell E. Van Horn, Chicago, Ill., assignor to QO Chemicals, Inc., West Lafayette, Ind.

Filed May 2, 1988, Ser. No. 189,228

Int. Cl.[4] B01D *3/34, 3/38*; C07C *51/44*

U.S. Cl. 203—15 **6 Claims**

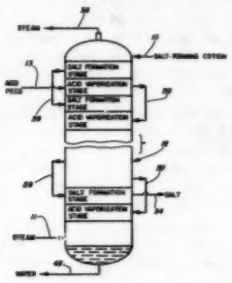
1. A process for removing a volatile acid from an aqueous solution thereof which comprises:

flowing steam upwardly within a distillation column having a plurality of alternately superimposed and separate salt formation zones and acid vaporization zones,

flowing an aqueous solution of a volatile acid downwardly within said distillation column through a plurality of said acid vaporization zones wherein it contacts upwardly flowing steam to effect at least partial vaporization of the acid,

passing said vaporized acid from each of said acid vaporization zones upwardly into a superimposed salt formation

zone within said distillation column wherein it contacts a liquid containing an acid reactive cation flowing downwardly within said salt formation zone to form an acid salt, and



removing from said distillation column an acid salt.

4,898,645

PROCESS FOR THE PRODUCTION OF PURE TETRAFLUOROETHYLENE

Hartmut Voigt, Winhöring, and Reinhold Freudenreich, Burgkirchen, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 30, 1988, Ser. No. 238,546

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1987, 3729106

Int. Cl.[4] B01D *3/34;* C07C *17/38*

U.S. Cl. 203—67 **8 Claims**

1. In a process for the production of pure tetrafluoroethylene from the gaseous pyrolysis products of a pyrolyzable C_1 to C_4 fluorocarbon which is pyrolyzable to form tetrafluoroethylene, said gaseous pyrolysis products comprising 20 to 70 percent by weight of tetrafluoroethylene and being essentially dry and essentially freed of any hydrogen chloride or hydrogen fluoride, condensing said pyrolysis gas to obtain a liquefied portion of the gas, introducing this liquefied portion of the gas into a first distillation column and separating by distillation at the top end of this column as a top product of the first column components boiling at a lower temperature than does tetrafluoroethylene, thereby forming a bottom product of the first distillation column and introducing this bottom product through an inlet into a second distillation column, distilling off pure tetrafluoroethylene as a top product of the second distillation column and discharging at the bottom of said column components boiling at a higher temperature than does tetrafluoroethylene, the improvement which comprises introducing into the second distillation column above the inlet for the bottom product of the first distillation column 0.6 to 2 kg of difluoromonochloromethane per 1 kg of tetrafluoroethylene discharged from the top of the second distillation column above the inlet for the bottom product of the first distillation column 0.6 to 2 kg of difluoromonochloromethane per 1 kg of tetrafluoroethylene discharged from the top of the second distillation column.

4,898,646

PROCESS FOR IDENTIFYING AL ALLOYS BY ELECTROCHEMICAL MEANS

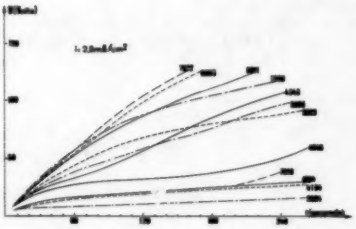
Christophe Bommier, Moirans; Philippe Gimenez, Grenoble; Jean-Claude Kucza, St. Etienne de Crossey, and Jacques Rabiet, Goncelin, all of France, assignors to Pechiney, Paris, France

Filed May 2, 1989, Ser. No. 346,532

Claims priority, application France, May 3, 1988, 88 06431

Int. Cl.[4] G01N *27/46*

U.S. Cl. 204—1 T **12 Claims**



1. Method of determining the nature of Al alloys of unknown designation comprising the steps of: subjecting a sample of an Al alloy to anodization to determine the shape and relative position of the curve $U=f(t)$ during intensiostatic operation, U being the voltage at the terminals of an electrolyzer and t the time, of which the analyzed sample constitutes the anode, the cathode being of 3003 or 1199; and making a comparison of the determined curve with a curve $U=f(t)$ derived from an Al alloy of known designation to generally establish coincidence of the two curves.

4,898,647

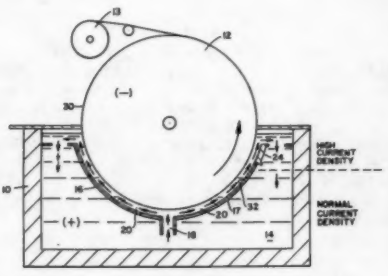
PROCESS AND APPARATUS FOR ELECTROPLATING COPPER FOIL

Betty M. Luce, and Betty L. Berdan, both of Willowick, Ohio, assignors to Gould, Inc., Eastlake, Ohio

Continuation-in-part of Ser. No. 813,097, Dec. 24, 1985. This application Dec. 22, 1988, Ser. No. 288,472

Int. Cl.[4] C25O *1/04*

U.S. Cl. 204—13 **31 Claims**



1. A process for producing surface treated metal foil, said process comprising:

providing an electrolytic cell having an electrolyte and a cathodic surface immersed in said electrolyte, said electrolyte containing a concentration of metal ions;

applying a first current density in a first zone for plating a relatively smooth metal foil deposit on said cathodic surface; and,

applying a continuous series of pulses of a second current density having a magnitude greater than the limiting cur-

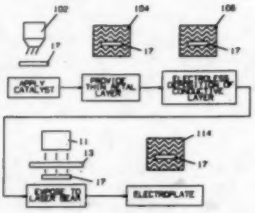
rent density in a second zone, said second current density forming a plurality of nodules on said metal deposit.

4,896,648

METHOD FOR PROVIDING A STRENGTHENED CONDUCTIVE CIRCUIT PATTERN

Dominic A. Cusano, Schenectady, N.Y., assignor to Pacific Bell, San Francisco, Calif.

Filed Nov. 15, 1988, Ser. No. 271,898
Int. Cl.[4] C25D 5/02; B05D 3/06, 3/10, 5/12
U.S. Cl. 204—15 5 Claims



1. A method for providing a patterned metallic layer on a surface of an insulating substrate comprising the steps of:

(a) providing a catalytic layer on said surface of said substrate for facilitating the deposition of metallic layers on said substrate;

(b) plating a first metallic layer of a predetermined thickness on said catalytic layer; and

(c) exposing first predetermined regions of said first metallic layer to an ablative laser beam so as to remove said first metallic layer in said first predetermined regions and to retain said first metallic layer in second predetermined regions.

4,898,649

METHOD FOR MANUFACTURING ELECTROLYTICALLY CHROMATED STEEL SHEET

Hiroki Iwasa; Toyofumi Watanabe, and Hirohide Furuya, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Feb. 10, 1989, Ser. No. 309,774
Claims priority, application Japan, Feb. 27, 1988, 63-45421
Int. Cl.[4] C25D 9/10
U.S. Cl. 204—28 2 Claims

1. In an improved method for manufacturing an electrolytically chromated steel sheet, comprising the steps of:

subjecting a steel sheet intermittently to a plurality of runs of cathodic electrolytic chromate treatment in an acidic electrolytic chromating solution, to form on at least one surface of said steel sheet a chromating film comprising a metallic chromium layer as a lower layer and a hydrated chromium oxide layer as an upper layer formed on said metallic chromium layer;

the improvement comprising

at least one of said plurality of runs of cathodic electrolytic chromate treatment is carried out at an electric current density within the range of from 90 to 200 A/dm^2, to form numerous granular projections over the entire surface of said metallic chromium layer of said chromating film.

4,898,650

LASER CLEANING OF METAL STOCK

Jeff C. Wu, Clemmons; George B. Cvijanovich, and Richard T. Williams, both of Winston-Salem, all of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 10, 1988, Ser. No. 197,773
The portion of the term of this patent subsequent to May 23, 2006, has been disclaimed.
Int. Cl.[4] C25D 5/34; B05D 3/06
U.S. Cl. 204—29 4 Claims

1. A method of cleaning the nickel plated surface of an electrically conductive metal by removing surface contaminants therefrom, by the application of an excimer laser light, where said contaminants strongly absorb the laser light and said nickel plated metal is capable of absorbing laser wavelengths between 193 and 351 nm by at least 10%, comprising the step of subjecting said nickel plated metal to at least a single pulse of a laser emitting at a wavelength between 193 and 351 nm for a controlled length of pulse width of from 3 to 100 nsec. and sufficient energy density to vaporize said contaminants.

4,898,651

ANODIC COATINGS ON ALUMINUM FOR CIRCUIT PACKAGING

Issa S. Mahmoud, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 145,805, Jan. 15, 1988. This application Aug. 25, 1989, Ser. No. 398,680
Int. Cl.[4] C25D 11/08
U.S. Cl. 204—29 6 Claims

1. A method of preparing aluminum alloy substrates for use in electrical packaging applications comprising the sequential steps of:

(a) cleaning aluminum alloy workpieces;

(b) polishing the aluminum alloy workpieces;

(c) rinsing the polished aluminum alloy workpieces;

(d) anodizing the aluminum alloy workpieces in an electrochemical cell in which the aluminum alloy workpieces are made positive and the cell solution comprises:

deionized water, sulfuric acid, a complexing agent, urea and ammoniated colloidal silica;

at a temperature of about 5 to about 15 degrees centigrade

at a current density initially of about 30 to about 50 amps per square foot

for a time determined as a function of the desired thickness in accordance with thickness=15 Angstroms per second times seconds;

(e) rinsing the anodized aluminum alloy workpieces in flowing deionized water; and

(f) drying the anodized aluminum workpieces in forced air.

4,898,652

POLYOXALKYLATED POLYHYDROXY COMPOUNDS AS ADDITIVES IN ZINC ALLOY ELECTROLYTES

Brian D. Bammel, Canton; Walter J. Wieczerniak, Utica, and Kenneth D. Snell, Rochester, all of Mich., assignors to OMI International Corporation, Warren, Mich.

Continuation-in-part of Ser. No. 835,489, Mar. 3, 1986, abandoned. This application Nov. 2, 1988, Ser. No. 265,962
Int. Cl.[4] C25D 3/56
U.S. Cl. 204—44.2 55 Claims

1. An aqueous acidic electrolyte suitable for electrodepositing zinc alloys on a conductive substrate comprising an effective amount of an additive agent comprising a bath soluble polyhydroxy compound having three or more hydroxyl groups at least one of which is substituted with an oxyalkylene group present in an amount effective to provide grain refinement of the zinc alloy electrodeposit, wherein said additive agent is substantially free of fatty acids or fatty acid moieties; zinc ions present in an amount of about 10 g/l to saturation; and an additional metal ion selected from the group consisting of iron ions present in an amount of about 5 to about 140 g/l,

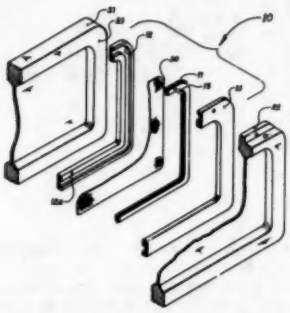
nickel ions present in an amount of about 0.5 to about 120 g/l, cobalt ions present in an amount of about 0.5 to about 120 g/l, and mixtures thereof.

4,898,653

COMBINATION ELECTROLYSIS CELL SEAL MEMBER AND MEMBRANE TENTERING MEANS

Gregory J. E. Morris, Milan, Italy, assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 26, 1988, Ser. No. 249,639
Int. Cl.[4] C25B *1/24, 9/00, 13/00*
U.S. Cl. 204—128 **11 Claims**



7. A method of operating an electrolytic cell comprising
(a) providing a seal/tentering member comprising an inflatable gasket member interposed between a first and second insulator members, said insulator members having a recess defining a compartment adapted for receiving the inflatable gasket member, said insulator members interposed between a pair of cell frame flanges;
(b) fastening a sheet-like separator against at least one of the insulator members of the seal/tentering member;
(c) interposing the seal/tentering member with separator between at least a first frame member and a second frame member, the separator spacing apart an anode and a cathode compartments defined by the first and second frame members and the separator; and
(d) compressing the seal/tentering member with separator and the first and second frame members together;
(e) feeding an aqueous alkali metal halide solution to the electrolytic cell; and
(f) passing an electrical current from the anode to the cathode such that a halide is evolved at the anode.

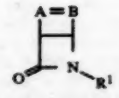
4,898,654

METHOD OF PRODUCING OPTICALLY ACTIVE β-LACTAM DERIVATIVES

Fumio Toda, Ehime; Kouichi Tanaka, Matsuyama; Masatoshi Taniguchi, Saita, and Michio Sassoka, Tokushima, all of Japan, assignors to Otsuka Kagaku Kabushiki Kaisha, Osaka, Japan

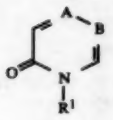
Filed May 26, 1989, Ser. No. 357,840
Claims priority, application Japan, May 27, 1988, 62-131263
Int. Cl.[4] B01J *19/08*
U.S. Cl. 204—157.71 **6 Claims**

1. A method of producing an optically active β-lactam derivative of the general formula



(II)

wherein A and B are the same or different and each is N, CH or C—R^2 in which R^2 is a lower alkyl group, a phenoxy group, a phenoxy group having 1 to 3 lower alkoxy groups as the substituent or a protected hydroxy group, and R^1 is a hydrogen atom, a lower alkyl group, a phenyl group, a phenyl group having 1 to 3 lower alkoxy groups as the substituent, a benzyl group or a benzyl group substituted with 1 to 3 lower alkoxy groups on the benzene ring, which comprises irradiating with light, in solid phase, an inclusion complex of a nitrogen-containing compound of the general formula



(I)

wherein A, B and R^1 are as defined above with an optically active host compound.

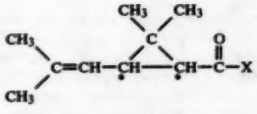
4,898,655

METHOD FOR RACEMIZATION OF OPTICALLY ACTIVE CHRYSANTHEMIC ACID OR ITS DERIVATIVES

Gohfu Suzukamo, Osaka, Japan; Yoji Sakito, Montreal, Canada; Masami Fukao, Shiga, Japan, and Koji Hagiya, Osaka, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Filed Jul. 15, 1988, Ser. No. 219,761
Claims priority, application Japan, Jul. 17, 1987, 62-179727; Sep. 28, 1987, 62-245656; Sep. 30, 1987, 62-248281; Mar. 31, 1988, 63-82040; Apr. 12, 1988, 63-89559; Apr. 21, 1988, 63-99962
Int. Cl.[4] B01J *19/08*
U.S. Cl. 204—157.87 **28 Claims**

1. A process for racemization of optically active chrysanthemic acid or its derivatives which comprises allowing optically active chrysanthemic acid or its derivatives of the formula



wherein X represents a hydroxyl group, a halogen atom, a C_{1-20} alkoxy group or a 2,2-dimethyl-3-isobutenylcyclopropane carboxyl group and * mark shows asymmetric carbon atoms, to react, in the presence of ultra violet light, with at least one bromine compound selected from the group consisting of hydrogen bromide, phosphorus bromide compounds, boron bromide compounds, aluminum bromide compounds, carboxylic acid bromides, tert.carbon-bromine compounds, N-bromine compounds, Si-bromine compounds, S-bromine compounds, and halo-bromine compounds or SH-compounds.

4,898,656

ELECTRODEPOSITION COATING PROCESS OF PHOTORESIST FOR PRINTED CIRCUIT BOARD

Masahiro Hoshino, Kobe; Isao Kobayashi, Takarazuka; Kenji Seko, Yokosuka; Naozumi Iwasawa; Yuu Akaki, both of Hiratsuka, and Toshio Kondo, Fujisawa, all of Japan, assignors to Kansai Paint Co., Ltd., Hyogo and Mitsubishi Denki Kabushiki Kaisha, Tokyo, both of, Japan

Filed Mar. 28, 1989, Ser. No. 329,636

Claims priority, application Japan, Mar. 28, 1988, 63-72083; Apr. 22, 1988, 63-98400; May 2, 1988, 63-109482; Jul. 28, 1988, 63-187031

Int. Cl.[4] C25D *13/04*

U.S. Cl. 204—181.1 16 Claims

1. An electrodeposition coating process of a photoresist for printed circuit board which comprises electrodeposition coating on a conductive surface a photosensitive electrodeposition coating composition (A), and thereafter further electrodeposition coating on the resultant coated plate an electrodeposition coating composition (B) composed chiefly of water-soluble or water-dispersible resin having a glass transition temperature (Tg) not lower than 20° C.

4,898,657

ELECTROPLATING APPARATUS FOR PLATE-SHAPED WORKPIECES

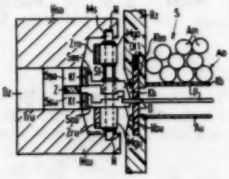
Daniel Hosten, Handzame, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 26, 1989, Ser. No. 371,634

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1988, 3823071

Int. Cl.[4] C25D *17/00*

U.S. Cl. 204—198 12 Claims



1. In an electroplating apparatus for plate-shaped workpieces which are being transported in a horizontal path through an electroplating cell of the apparatus, said apparatus comprising a plurality of contact clamps arranged at a distance from one another and laterally displaced outside of the cell for gripping an edge of the workpiece for cathodic contacting of the workpiece, a cathode current being supplied to the contact clamps by at least one live rail and by contact springs on the basis of a wiping contact, the improvements comprising said live rail comprising a core composed of a material having electrical conductivity and being provided with an envelope composed of a material having a high resistance to corrosion, each contact spring being composed of a material having a high resistance to corrosion, and said contact springs being connected to the live rail mechanically in an electrically conductive fashion.

4,898,658

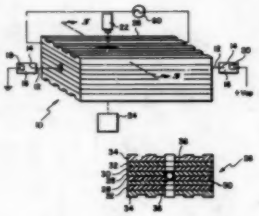
INTEGRATED TEMPERATURE CONTROL/ALIGNMENT SYSTEM FOR HIGH PERFORMANCE CAPILLARY ELECTROPHORETIC APPARATUS

Barry L. Karger, Newton; Aran Paulus, Boston; Aharon S. Cohen, Brookline, and Robert J. Nelson, Boston, all of Mass., assignors to Northeastern University, Boston, Mass.

Filed Nov. 25, 1987, Ser. No. 125,539

Int. Cl.[4] G01N *27/26*

U.S. Cl. 204—299 R 19 Claims



1. An integrated temperature control/alignment system disposed in an ambient environment for use with a high performance electrophoretic apparatus including a capillary column and an externally prepositioned on-column detection device, comprising:

means for thermoelectrically regulating heat transfer between the capillary column and the ambient environment to maintain the capillary column at a predetermined electrophoretic operating temperature, said thermoelectric regulating means including

means for mounting the capillary column as part of the electrophoretic apparatus, said mounting means being formed from an electrical insulating material having a coefficient of thermal conductivity to provide efficient heat transfer between the capillary column and said mounting means sufficient to maintain the capillary column at said predetermined electrophoretic operating temperature, said mounting means including

means for aligning the capillary column in a predetermined position to the externally prepositioned on-column detection device within said integrated temperature control/alignment system as part of the electrophoretic apparatus for on-column detection, and

means for physically engaging the capillary column to lock the capillary column in said predetermined position within said integrated temperature control/alignment system.

4,898,659

MULTI-POINT COLD SOLVENT INJECTION IN SCRAPED SURFACE DEWAXING CHILLERS

Thomas E. Broadhurst, Sarnia, Canada, assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Mar. 21, 1988, Ser. No. 171,675

Int. Cl.[4] C10G *43/08*

U.S. Cl. 208—33 3 Claims

1. In the solvent dewaxing of waxy hydrocarbon oils using indirectly cooled scraped surface chillers the improvement comprising injecting cold dewaxing solvent into the scraped surface chillers at multiple points to form a wax/oil/solvent slurry and controlling the ΔT occurring at each injection point within each chiller bank across the entire chiller train, so that the ΔT at each injection point attributable only to cold solvent injection is equal.

4,898,660

CATALYTIC USES OF CRYSTALLINE METALLOPHOSPHATE COMPOSITIONS

Stephen T. Wilson, Shrub Oak; Brent M. Lok, New York, and Edith M. Flanigen, White Plains, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 472,135, Mar. 4, 1983, abandoned, which is a division of Ser. No. 315,055, Oct. 26, 1981, Pat. No. 4,385,994, which is a division of Ser. No. 166,333, Jul. 7, 1980, Pat. No. 4,310,440. This application Oct. 20, 1983, Ser. No. 544,080

Int. Cl.[4] C10G *11/02*

U.S. Cl. 208—114 10 Claims

1. Process for converting a hydrocarbon which comprises contacting said hydrocarbon under hydrocarbon converting conditions with an aluminophosphate having a framework structure whose chemical composition expressed in terms of mole ratios of oxides is:

$$Al_2O_3{:}1.0{\pm}0.2\ P_2O_5$$

said framework structure being microporus in which the pores are uniform and have nominal diameters within the range of about 3 to about 10 Angstroms, an intracrystalline adsorption capacity for water at 4.6 torr and 24° C. of at least 3.5 weight percent, the adsorption and desorption of water being completely reversible while retaining the same essential framework toplogy in both the hydrated and dehydrated state.

4,898,661

METHOD FOR DEWAXING HYDROCARBON OIL EMPLOYING CRYSTALLINE ALUMINOSILICATES PROMOTED WITH A SOLID FLUORINE COMPOUND

Masaru Ushio, Yokohama, and Hajime Okazaki, Kawasaki, both of Japan, assignors to Nippon Oil Co., Ltd., Japan

Continuation-in-part of Ser. No. 788,242, Oct. 17, 1985, abandoned. This application Jul. 29, 1987, Ser. No. 79,233

Claims priority, application Japan, Oct. 18, 1984, 59-218847

Int. Cl.[4] C10G *35/08, 11/08*

U.S. Cl. 208—117 18 Claims

1. A method for dewaxing hydrocarbon oil which is characterized by bringing said hydrocarbon oil into contact with a catalyst which is prepared by mixing a crystalline aluminosilicate having an SiO_2/Al_2O_3 molar ratio between 12 and less than 70 with at least one solid fluorine compound selected from aluminum fluoride, ammonium fluoride, zinc fluoride, cadmium fluoride, manganese fluoride, chromium fluoride, tin fluoride, copper fluoride and silver fluoride; molding the resulting mixture; and calcining the molded mixture at a temperature of 100° to 700° C. for a time of 0.5 hour or more; said crystalline aluminosilicate being obtained by exposing a gelled reaction mixture consisting of a silica source, an alumina source, an alkali source, water and an organic compound in the molar composition ratio

$SiO_2/Al_2O_3 = 10$ to 100

$H_2O/SiO_2 = 5$ to 100

$OH^-/SiO_2 = 0.01$ to 1.0

$R/Al_2O_3 \geq 0.05$

wherein R is said organic compound, to hydrothermal synthetic conditions of a reaction temperature of 50° to 300° C. for a reaction time of 3 hours to 1 month.

4,898,662

CATALYTIC CRACKING PROCESS USING HIGH EQUILIBRIUM ACTIVITY ADDITIVE CATALYST

Pochen Chu, West Deptford, and Sadi Mizrahi, Cherry Hill, both of N.J., assignors to Mobil Oil Corp., New York, N.Y.

Division of Ser. No. 130,491, Dec. 9, 1987, Pat. No. 4,818,738. This application Oct. 31, 1988, Ser. No. 264,577

Int. Cl.[4] C10G *11/05*

U.S. Cl. 208—120 15 Claims

1. A process for the catalytic cracking of a hydrocarbon feedstock under cracking conversion conditions in the presence of a mixture of catalysts comprising:

(i) a cracking catalyst, and

(ii) an additive catalyst comprising a crystalline zeolite having a Constraint Index of from about 1 to about 12 and having at least 10% of the exchangeable cation sites occupied by cations, said cations selected such that the cationic form of said zeolite is thermodynamically favored at cation loading conditions and the hydrogen form of said zeolite is thermodynamically favored under catalytic cracking unit regenerator steaming conditions, said zeolite bound in a matrix chosen such that the matrix component forms a thermodynamically favored compound with said cations under catalytic cracking unit regenerator steaming conditions wherein the maintenance of the activity of the additive zeolite is enhanced.

4,898,663

METHOD FOR CONTROLLING SEDIMENTATION IN AN EBULLATED BED PROCESS

Scott M. Sayles; William B. Livingston, and Michael P. Bellinger, all of Baton Rouge, La., assignors to Texaco Inc., White Plains, N.Y.

Filed Nov. 25, 1988, Ser. No. 275,831

Int. Cl.[4] C10G *17/00, 45/20*

U.S. Cl. 208—178 3 Claims

1. In a continuous process for treating a fluid hydrocarbon feedstock with a hydrogen-containing gas at elevated catalytic reaction temperatures and pressures in the presence of a bed of particulate solid catalyst, said process comprising introducing the hydrogen-containing gas and feedstock into the lower end of a generally vertical catalyst containing reaction vessel wherein the catalyst is placed in random motion within the fluid hydrocarbon whereby the catalyst bed is expanded to a volume greater than its static volume, wherein the mixture of feedstock, gas and catalyst constitutes a turbulent zone from which zone aged catalyst is removed and fresh catalyst is added, the upper portion of which turbulent zone is defined by an interface with a substantially catalyst depleted zone from which zone hydrocracked product is removed, and wherein said fluid hydrocarbon feedstock is changed from a first, sediment yielding feedstock F_1 to a second feedstock of different sediment yield wherein the improvement comprises:

a. setting the flow rate of the first feedstock F1 at a first flow rate F1(1),

b. initiating flow of said second feedstock F2 at a first flow rate F2(1),

c. increasing the flow rate of the second feedstock to a second flow rate F2(2) at which a selected concentration of sediment in the hydrocracked product is reached, and then increasing the flow rate of the second feedstock until a selected steady state flow rate F2(SS) is reached,

d. maintaining said steady state flow rate F2(SS) until the concentration of sediment drops below the selected concentration,

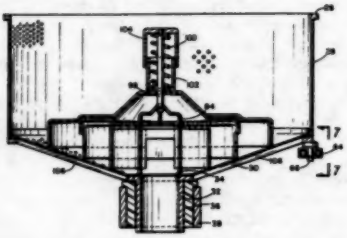
e. reducing the flow rate of the first feedstock F1 at a rate such that the selected concentration of sediment is not exceeded.

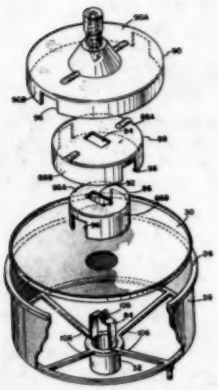
4,898,664

SIFTER FOR USE IN SEPARATING DOUGH BALLS FROM BREADING

Vernon E. Reece, 1936 W. 47th Pl., Tulsa, Okla. 74125

Division of Ser. No. 226,223, Jul. 29, 1988, Pat. No. 4,862,824.
This application Apr. 17, 1989, Ser. No. 339,382
Int. Cl.[4] B07B 1/00
U.S. Cl. 209—235 5 Claims





1. A sifter for use in separating dough balls from breading comprising:

a sifter basket having a foraminous portion through which breading but not dough balls can pass and having a bottom with a central opening therein of a size which permits the passage of dough balls therethrough;

a plurality of inverted cup shaped members each having an enclosing top wall portion and a circumferential downwardly extending side wall and each side wall having at least one notched opening therein, the inverted cup-shaped members being of different diameters and concentrically arranged upon one another in a stacked array with the top wall portions of adjacent cup-shaped members being in abutting engagement and the smallest diameter cup-shaped member on the bottom and the largest diameter cup-shaped member on top;

means to removeably retain said inverted cup-shaped members in the stacked array adjacent said sifter basket bottom thereby providing a labyrinth path between an outermost surface of the side wall of the largest diameter cup-shaped member and the interior of the smallest diameter inverted cup shaped member through which dough balls pass to reach said central opening; and

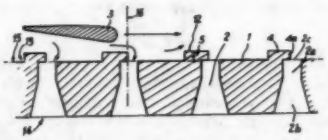
means to vibrate said basket to cause breading to be sifted therefrom.

4,898,665

SCREENS FOR PAPER PULP PURIFIERS

Jean-Pierre Lamort, Vitry Le Francois, France, assignor to E & M Lamort, Vitry Le Francois, France

Filed Apr. 4, 1988, Ser. No. 177,502
Claims priority, application France, Apr. 6, 1987, 87 04833
Int. Cl.[4] B07B 1/04
U.S. Cl. 209—273 13 Claims



1. A screening device, comprising:

a screening element with a perforated surface and a plurality of perforations each passing through said screening element, each of said perforations having an inlet at said perforated surface and an outlet spaced from said perforated surface;

means for producing turbulence in a flow of fluid passing through said perforations and for directing the flow directly into said perforations, said producing and directing means including a plurality of obstacles, each of said obstacles extending from an area on said perforated surface that is upstream of a respective one of said inlets and further extending into an area that is over at least a portion of said respective one of said inlets so as to constitute an entry baffle; and

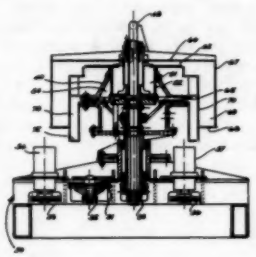
a hydrodynamic profiled blade for preventing said perforations from clogging, said blade being arranged upstream of said perforations and obstacles and being rotatable for creating pulsations of flow into said perforations with each pass.

4,898,666

ROTATING CENTRIFUGAL JIG WITH PULSATOR

Christopher G. Kelsey, Sydney, Australia, assignor to Lowan (Management) Pty. Limited, East Glenelg, Australia

PCT No. PCT/AU86/00016, § 371 Date Sep. 22, 1986, § 102(e) Date Sep. 22, 1986, PCT Pub. No. WO86/04269, PCT Pub. Date Jul. 31, 1986
PCT Filed Jan. 24, 1986, Ser. No. 939,520
Claims priority, application Australia, Jan. 25, 1985, PH9037; Apr. 12, 1985, PG0122
Int. Cl.[4] B03B 5/12
U.S. Cl. 209—425 15 Claims



1. A centrifugal jig comprising a container mounted for rotation about its longitudinal axis, the container comprising an axial region and a peripheral region, ragging separating said regions, means for rotating said container, means for introduc-

ing feed material to the axial region, means for supplying fluid to said peripheral region, and means for pulsating the fluid in said peripheral region while the container rotates, said pulsating means comprising interface means communicating with said peripheral region, said interface means being located substantially wholly outside the volume defined by the free surface of the feed material and the projection of that free surface to its intersection with said longitudinal axis.

4,898,667

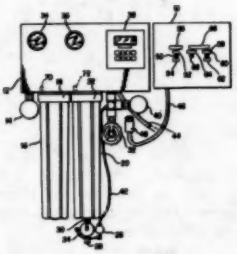
POINT-OF-USE MEMBRANE FILTRATION SYSTEM

Charles Diman, Billerica; David Marcus, Newton; Philip Mitchell, East Walpole, and Samuel B. Sachs, Brookline, all of Mass., assignors to The Kendall Company, Boston, Mass.

Filed Mar. 14, 1988, Ser. No. 167,658

Int. Cl.[4] B01D *21/30, 27/00*

U.S. Cl. 210—138 **16 Claims**



1. A filtration system for producing depyrogenated water comprising:

a filter cartridge,

said filter cartridge having an inlet conduit means for charging liquid into said cartridge,

said inlet means having a drain valve, whereby liquid may be drained therefrom when said drain valve is in the open position,

said inlet means having a reject valve, whereby liquid may be drained therefrom when said reject valve is in the open position,

said filter cartridge having an outlet means,

said outlet means having a product dispensing valve,

said outlet means having a rinsing valve,

means for maintaining said water to be dispensed in a depyrogenated condition between periods of non-use of the said system consisting essentially of,

means for opening said reject valve in response to the opening of said product dispensing valve,

means for automatically periodically opening said drain valve for a preselected period of time,

means for opening said rinsing valve for a preselected period of time.

4,898,668

FUEL FILTER WITH HEATER

David H. Hodgkins, Granby, and Alex Shinkevich, West Suffield, Conn., assignors to Stanadyne Automotive Corp., Windsor, Conn.

Filed Sep. 30, 1988, Ser. No. 251,907

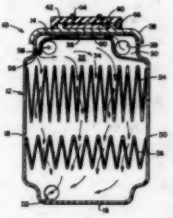
Int. Cl.[4] B01D *35/8*

U.S. Cl. 210—180 **20 Claims**

10. A fuel conditioner comprising:

a housing having a fuel inlet port, a fuel outlet port, and an inner defining a location for containing at least one filter element;

a baffle plate situated within the housing between the inlet port and said location, the baffle plate conforming in shape with and being in adjacent closely spaced relation to a selected portion of the housing thereby defining a flow passage between the plate and the housing portion through which fuel makes a single pass from the inlet port to said location;



heater means situated on the exterior of said portion of the housing, and having a heating surface in contact with and conforming to said exterior of said selected housing portion for controlling the temperature of the fuel passing through the flow passage by the transfer of heat through the housing portion to the fuel in the flow passage.

4,898,669

VASCULAR ACCESS DEVICE, IN PARTICULAR FOR PURIFICATION TREATMENTS OF THE BLOOD

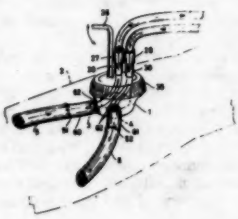
Franco Tesio, Pordenone, Italy, assignor to Claber S.p.A., Italy

Filed Jun. 13, 1988, Ser. No. 206,105

Claims priority, application Italy, Jun. 16, 1987, 20908 A/87

Int. Cl.[4] B01D *13/00;* **A61M** *5/00*

U.S. Cl. 210—232 **6 Claims**



1. A vascular access device, comprising:

a case designed to be grafted permanently in living tissue and having a pair of connections for blood vessels, the connections being structured to couple with respective ends of at least one cut blood vessel, the case having an outer surface covered with a first layer of damping material on which is arranged a second layer of biocompatible material weldable to the living tissue;

a two-position valve removably housed in said case and a pair of access ports for removal means and admission means for blood, the valve being a rotary valve having two independent passages wherein, in a first rotational angular position of the valve the passages establish connection between a first of the connections and a first of the access ports and between a second of the connections and a second of the access ports, respectively, and in a second rotational angular position of the valve the passages establish connection between said first and second connections and between said first and second access ports, respectively, said access ports being formed in a retaining element for said valve and being connected to the passages by unions formed in the case, the retaining element being

removably locked by a ringnut screwed onto the case; and,

a plate having two portions, each of the portions having an upper sleeve and a lower sleeve, said upper sleeves being structured to receive said removal means and said admission means for the blood and said lower sleeves being structured to penetrate said access ports, the plate being lockable on the vascular access device by a shaped ring threadable onto the case.

4,898,670

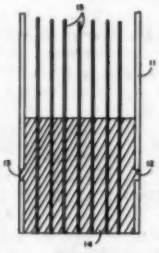
CARTRIDGE BONDING

Arye Z. Gollan, Needham, Mass., assignor to A/G Technology Corporation, Needham, Mass.

Continuation of Ser. No. 745,783, Jun. 17, 1985, abandoned. This application Jun. 8, 1987, Ser. No. 59,583

Int. Cl.[4] B01C *13/00*

U.S. Cl. 210—232 **3 Claims**



3. In an assembly of a housing with a wall of substantially uniform inside diameter for a structure sealed with a potting compound engaging the inside of said wall inside said housing, the improvement comprising,

mechanical locking means for mechanically locking said potting compound to said housing and extending into a region coextensive with the housing wall,

said housing having an end edge perpendicular to the axis of said housing adjacent to said regional formed with a plurality of openings in said wall with said mechanical locking means comprising at least one of a portion of said potting compound extending over and contacting said end edge, and a portion of said potting compound extending into said openings,

said structure comprising a hollow fiber membrane potted to said housing by said potting compound and extending through the axial length of said potting compound.

4,898,671

FILTERING DEVICE FOR THE SEPARATION OF LIQUIDS AND SOLIDS

Kamil Fux, Schiebel, Schmerikon, and Ludwig Gresa, Bohlstrasse 6, Uznach, both of Switzerland

Division of Ser. No. 448,982, Nov. 24, 1982, Pat. No. 4,702,847. This application Oct. 13, 1987, Ser. No. 112,377

Claims priority, application Switzerland, Mar. 25, 1981, 2005/81

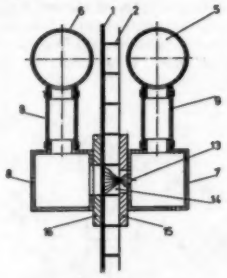
Int. Cl.[4] B01D *23/24, 29/38*

U.S. Cl. 210—333.01 **8 Claims**

1. A filter apparatus for separating a liquid slurry into a solids fraction and a liquid fraction, comprising:

a generally flat filter consisting essentially of a single support grid and a filter material located on one side of said support grid, said filter having an inflow side and an outflow side, said inflow side carrying said filter material and having solids deposited thereon and said outflow side being supported by said single grid, said grid subdividing said outflow side into a plurality of separate injection chambers and defining a plurality of separate small regions of said filter, said grid being only located on said outflow side;

jet means for directing a stream of liquid through one of said injection chambers and against one of said small regions of said filter defined by said one injection chamber, said jet means including a cover plate directly contacting and engaging said grid to close said one injection chamber opposite said filter material;



sludge removing means, directly contacting and engaging said inflow side of said filter and aligned with said jet means, for receiving solids dislodged from said filter by said stream of liquid; and

moving means, coupled to said jet means and said sludge removing means, for simultaneously moving and maintaining alignment of said jet means and said sludge removing means to that said jet means and said sludge removing means close selectively each of said injection chambers to direct a stream of liquid therethrough.

4,898,672

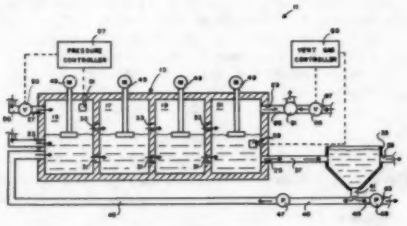
OXYGEN CONTROLLING WASTEWATER TREATMENT METHOD

Ricky C. Clifft, 21 Meriweather Dr., Paragould, Ark. 72450, and Melrose T. Garrett, 5237 Chesapeake Way, Houston, Tex. 77056

Division of Ser. No. 96,004, Sep. 14, 1987, Pat. No. 4,846,965. This application Apr. 10, 1989, Ser. No. 335,580

Int. Cl.[4] C02F *3/26*

U.S. Cl. 210—614 **4 Claims**



1. A method of treating wastewater using an aeration tank of the type having an interior divided into at least a first chamber and a last chamber with each of said chambers having a lower portion and an upper portion and having liquid passageways in said lower portions of each of said chambers and gas passageways in said upper portions of each of said chambers for allowing liquid and gas to pass sequentially through each of said chambers from said first chamber to said last chamber, having

an effluent outlet associated with said last chamber of said aeration tank for allowing treated water to exit said aeration tank; and having agitator means to enhance oxygen transfer from said upper portion to said lower portion of said aeration tank; said method comprising the steps of:

(a) adding wastewater and return sludge to said lower portion of said first chamber of said aeration tank at least until said wastewater and return sludge flows from said first chamber to said last chamber of said aeration tank through said liquid passageways in said lower portion of each of said chambers of said aeration tank;

(b) introducing high-purity oxygen into said first chamber of said aeration tank;

(c) maintaining the pressure in said upper portion of said first chamber of said aeration tank to at or slightly below existing atmospheric pressure; and

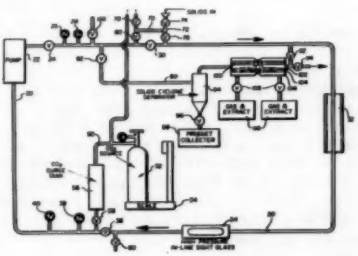
(d) maintaining the dissolved oxygen in the effluent from said last chamber by removing gas by vacuum from said last chamber of said aeration tank.

4,898,673

DYNAMIC SUPERCRITICAL FLUID EXTRACTION SYSTEM

Wayne K. Rice, Wanatah, Ind., and Laxman Singh, South Holland, Ill., assignors to Vitamins, Inc., Chicago, Ill.

Filed Jul. 11, 1987, Ser. No. 61,787
Int. Cl.[4] B01D *11/00*
U.S. Cl. 210—634 **15 Claims**



1. A method of carrying out a dynamic extraction comprising:

charging a closed-loop first stage of a dynamic system with extracting solvent under pressure;

pumping said solvent to cause flow in said closed-loop first stage;

injecting material to be extracted under pressure into said flowing solvent in said closed-loop first stage to form a co-currently flowing mixture with said solvent;

removing said mixture from said system;

separating a liquid comprising extract dissolved in solvent from said removed mixture; and

separating said extract from said solvent and recovering extract.

4,898,674

SOLVENT DEWAXING PROCESS

Mordechai Pasternak, Spring Valley, and Tansukhlal G. Dorawala, Wappingers Falls, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Mar. 24, 1988, Ser. No. 172,663
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—638 **12 Claims**

1. A process for treating a charge solution containing an organic oxygen-containing wax antisolvent and an aromatic hydrocarbon oil solvent in a charge ratio of organic oxygen-containing wax antisolvent to aromatic hydrocarbon oil solvent which comprises

passing a charge solution containing an organic oxygen-containing wax antisolvent and an aromatic hydrocarbon oil solvent in a charge ratio of organic oxygen-containing wax antisolvent to aromatic hydrocarbon oil solvent into contact with, as non-porous pervaporation membrane, a high molecular weight ion exchange resin in membrane form having carbon atoms in the backbone bearing a pendant acid group which membrane has been contacted with as counter ion, a potassium salt or with a quaternary phosphonium salt containing hydrocarbyl groups;

maintaining a pressure drop across said pervaporation membrane thereby forming (i) a retentate containing decreased content of oxygen-containing wax antisolvent; and

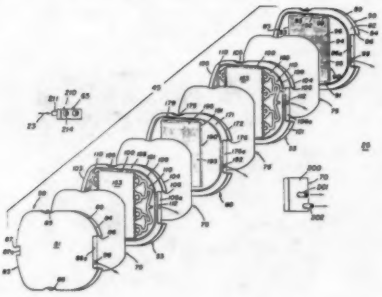
recovering said retentate containing decreased content of oxygen-containing wax antisolvent and said permeate containing increased content of oxygen-containing wax antisolvent.

4,898,675

SYSTEM AND METHOD FOR CONTINUOUSLY FRACTIONATING BLOOD IN SITU

Ardis R. Lavender, 15 Deerfield Rd., Chappaqua, N.Y. 10514

Continuation-in-part of Ser. No. 523,007, Aug. 15, 1983. This application Dec. 16, 1985, Ser. No. 809,923
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—651 **48 Claims**



1. A method of collecting plasma from a living donor thereof, comprising: ascertaining the donor's initial plasma volume, extracting blood from the donor, and separating plasma from the extracted blood until a predetermined percentage of the donor's initial plasma volume has been separated.

4,898,676

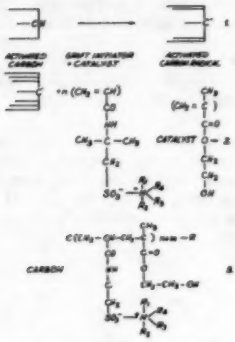
BACTERIOSTATIC ACTIVATED CARBON FILTER

Carl Horowitz, Brooklyn; Mohan Sanduja, Flushing, and Michael Dichter, deceased, late of Brooklyn, all of N.Y. (by Anna Dichter, heir), assignors to Puro Corporation of America, Maspeth, N.Y.

Filed Sep. 14, 1988, Ser. No. 244,502
Int. Cl.[4] C02F *1/28*
U.S. Cl. 210—668 **4 Claims**

1. Method for the purification of water by activated carbon while preventing bacterial growth on and around the activated

carbon, said method comprising passing water to be purified across activated carbon which has chemically grafted thereto



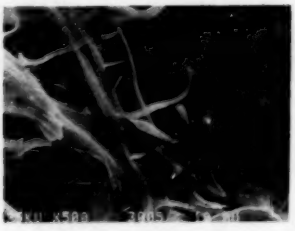
a polymerized salt of a polymerizable anionic monomer and a cationic germicide.

4,898,677

PROCESS FOR INHIBITING SCALE FORMATION AND MODIFYING THE CRYSTAL STRUCTURE OF BARIUM SULFATE AND OTHER INORGANIC SALTS

Ingrid E. Brase, E. Windsor, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Nov. 10, 1986, Ser. No. 929,127
Int. Cl.[4] C02F 5/10
U.S. Cl. 210—701 **4 Claims**



1. A method of inhibiting the deposition of barium sulfate scale in a downhole aqueous system containing at least 50 ppm of barium sulfate, which consists of adding an effective scale-inhibiting amount of a water-soluble copolymer having a weight ratio of 70–95% acrylic acid and 5–30% of an alkali metal vinyl sulfonate, the copolymer having a weight average molecular weight of below about 90,000, wherein the solubility and/or the dispersibility of the barium sulfate is enhanced and the crystal structure of the barium sulfate is modified to produce fibers.

4,898,678

HEAVY-METAL SEPARATOR FOR DRINKING WATER

Charles G. Johnson, 19150 Saddle La., Apple Valley, Calif. 92308, and Candido O. Sanchez, 953 Arbor St., Costa Mesa, Calif. 92627

Filed Dec. 12, 1988, Ser. No. 282,685
Int. Cl.[4] B01D 21/02
U.S. Cl. 210—741 **13 Claims**

8. A method of separating lead particles from drinking water obtained from a main water-supply source, comprising the steps of:

supplying lead-contaminated water from an incoming water-supply source to a first separator tank;

allowing the lead particles to precipitate to the bottom of said first separator tank;

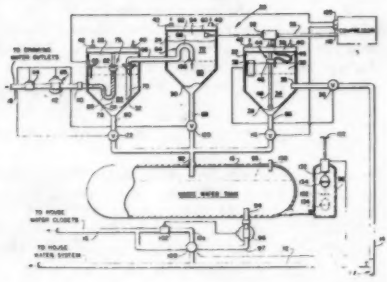
transferring the upper selective surface portion of water from said first separator tank to a second separator tank by means of a first transfer means;

allowing the lead particles in said second separator tank to precipitate to the bottom thereof;

siphoning the upper surface portion of water from said second separator tank by a second water transfer means so as to deposit said water into a third separator tank;

allowing the remaining lead particles to precipitate to the bottom of the third separator; and

pumping lead-free water from said third separator tank;



discharging lead-contaminated water from the bottoms of said first, second and third separator tanks into a waste-water tank;

draining said lead-contaminated water from said waste-water tank into a drain conduit;

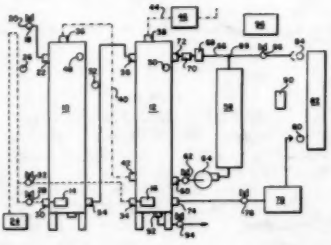
said draining being controlled by a valve means located in said drain conduit, said valve means operated by a switch control means operated by the level of waste water in said waste-water tank; and by a pressure-regulated pump means in said drain conduit between said waste-water tank and said valve means, said pump means operated by pressure-sensing means positioned downstream from said valve means.

4,898,679

METHOD AND APPARATUS FOR OBTAINING OZONE SATURATED WATER

Seymour Siegel, Feeks La., Mill Neck, N.Y. 11765, and Louis Maggio, 20 Woodoak Dr., Westbury, N.Y. 11590

Filed Feb. 1, 1989, Ser. No. 305,440
Int. Cl.[4] C02F 1/78
U.S. Cl. 210—752 **18 Claims**



1. A method for obtaining ozone saturated water comprising introducing water into a first zone, bubbling ozone into the water in said first zone for a time sufficient to kill substantially all bacteria present in said water and form ozone demand-free

water, passing the ozone demand-free water from said first zone to a second zone, bubbling ozone into said ozone demand-free water in said second zone while passing said ozone demand-free water from said second zone into a chilling zone, chilling said ozone demand-free water in said chilling zone, returning the chilled ozone demand-free water to said second zone while continuously adding ozone thereto in said second zone and increasing the ozone in said chilled ozone demand-free water to a specific excess amount until said chilled ozone reaches a temperature of between 32 to 38 degrees Farenheit.

4,898,680

DETERGENT COMPATIBLE, DRYER RELEASED FABRIC SOFTENING/ANTISTATIC AGENTS

Allen D. Clauss; Gayle E. Culver; David M. Platt, and Thomas J. Wierenga, all of Cincinnati, Ohio, assignors to The Proctor & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 58,449, Jun. 5, 1987, abandoned, which is a continuation-in-part of Ser. No. 933,824, Nov. 24, 1986, Pat. No. 4,828,746. This application Nov. 7, 1988, Ser. No. 270,402
The portion of the term of this patent subsequent to May 9, 2006, has been disclaimed.
Int. Cl.[4] C11D *3/30;* D06M *13/46*
U.S. Cl. 252—8.8 **11 Claims**

1. A through-the-wash detergent and fabric softening composition comprising:

(A) from about 1% to about 50% of detersive surfactant;

(B) from about 15% to about 60% of detergency builder;

(C) from about 0.5% to about 10% of detergent-compatible, dryer activated fabric softener composition in particulate form, the said particles comprising:

(a) an inner core of fabric softener composition consisting essentially of at least about 10% of a cationic fabric softener, the said softener composition having a melting point of from about 50° C. to about 80° C. and the remainder of said inner core being materials which can be applied to fabrics along with said cationic fabric softener in a laundry dryer; and

(b) a coating surrounding said core, said coating being a substantially water-insoluble material having a melting point above about 35° C. and a penetration value of about 0.6 mm or less as measured by ASTM Test D-1321, modified by using a 100 gram weight, said water-insoluble material being selected from the group consisting of: cellulose ethers, cellulose esters, and mixtures thereof;

the said coating comprising from about 3% to about 30% of said particle, the said inner core comprising from about 97% to about 70% of said particle, and the said particles having a size of from about 5 to about 1,000 microns.

4,898,681

HYPOCHLORITE DISTINFECTANT STABILIZED WITH CALCIUM CHELANT

Charles D. Burton, 3807 Chestnut Hill Dr., Midland, Mich. 48640

Filed Aug. 31, 1988, Ser. No. 238,466
Int. Cl.[4] D06L *3/08;* C11D *3/395;* A61L *2/16;* A01N *33/04*
U.S. Cl. 252—102 **8 Claims**

1. A dilute aqueous sodium hypochlorite solution stabilized against decomposition during storage consisting essentially of dilute aqueous sodium hypochlorite and a small but effectively stabilizing proportion of the calcium chelate of disodium ethylenediaminetetraacetic acid.

4,898,682

CORROSION INHIBITED SYNTHETIC LUBRICANTS

Takateru Dekura, No. 1-3, Sasame-cho, Kamakura-shi, Kanagawa-ken, Japan

Filed Oct. 3, 1988, Ser. No. 252,104
Claims priority, application Japan, Aug. 11, 1988, 63-201749
Int. Cl.[4] C10M *105/70*
U.S. Cl. 252—47.5 **1 Claim**

1. Anti-corrosion synthetic lubricants of the formula Rf—N-H—Z or 2(Rf—NH)Z, wherein Rf has a molecular weight of from 200 to 15,000 and is a member selected from the group consisting of:

$X(C_3F_6O)_{\overline{l}}CFYCO$,

$X(C_3F_6O)_{\overline{l}}(CF_2O)_{\overline{m}}CFYCO$,

$X(C_2F_4O)_{\overline{l}}(CF_2O)_{\overline{m}}CFYCO$,

$X(CF_2)_{\overline{l-1}}CO$,

$X(CF_2)_{\overline{l-1}}CH_2CO$, and

$X(CF_2)_{\overline{l-1}}CH_2CH_2CO$,

wherein l is an integer from 3 to 150, m is an integer from 1 to 50, X is H—, F—, CF_3—, C_2F_5—, C_3F_7—, CF_3O—, C_2F_5O—, or C_3F_7O—, and Y is F—, CF_3—, or C_2F_5—; and Z is a heterocyclic group selected from the group consisting of triazole, tetrazole, thiazole and thiadiazole groups.

4,898,683

SYNTHETIC LUBRICANTS

Takateru Dekura, No. 1-3, Sasame-cho, Kamakura-shi, Kanagawa-ken, Japan

Filed Dec. 6, 1988, Ser. No. 280,357
Claims priority, application Japan, Aug. 23, 1988, 62-209774
Int. Cl.[4] C10M *137/16*
U.S. Cl. 252—51 **3 Claims**

1. Synthetic lubricant obtained by amidation of phosphonitrilic acid by way of nucleophilic substitution, said synthetic lubricant having the formula:

wherein, n is from 3 to 10; X and X' are each NH or NH_2, with the proviso that X and X' are not both NH_2; Rf and Rf' are each a member selected from the group consisting of $Y(C_3F_6O)_lCFZCO$, $Y(C_3F_6O)_l(CF_2O)_mCFZCO$, $Y(C_2F_4O)_l(CF_2O)_mCFZCO$, $Y(CF_2)_{l-1}CO$, $Y(CF_2)_{l-1}CH_2CO$, and $Y(CF_2)_{l-1}CH_2CH_2CO$, wherein $l<m$, l is an integer from 3 to 150, m is an integer from 1 to 50, Y is H—, CF_3—, or C_2F_5—; and wherein CF_3O—, C_2F_5O—, or C_3F_7O—, and Z is F—, is F—, CF_3—, or C_2F_5—; and wherein when X or X' is NH_2, Rf or Rf' respectively, is absent.

4,898,684

NOVEL AMINE-CONTAINING COPOLYMERS AND THEIR USE

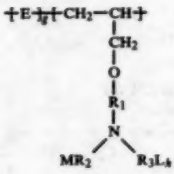
Fu Chen, Newtown, and William S. Carey, Ridley Park, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Division of Ser. No. 214,989, Jul. 5, 1988, Pat. No. 4,868,263, which is a continuation-in-part of Ser. No. 37,484, Apr. 13, 1987, Pat. No. 4,759,851, Continuation of Ser. No. 864,049, May 16, 1986, Pat. No. 4,659,481, which is a continuation of Ser. No. 545,563, Oct. 26, 1983, abandoned. This application Jul. 17, 1989, Ser. No. 380,847

Int. Cl.[4] C02F *5/10*

U.S. Cl. 252—181 3 Claims

1. A composition comprising a water soluble polymer, having the structure:



wherein E in the above formula is the repeat unit remaining after polymerization of a polymerizable monomer, containing pendant carboxylic acid or water-soluble salts thereof, carboxylic amide, lower alkyl (C_1–C_6) ester, or lower (C_1–C_6) alkyl hydroxylated ester of such carboxylic acids and wherein R1 in the above formula comprises a C_1–C_6 linear or branched alkylene or substituted alkylene, R_2 and R_3 independently represent hydrogen, C_1–C_5 lower alkylene or substituted lower alkylene, and M and L, independently represent hydrogen or a water-soluble cation further comprising polyvalent metal salts.

4,898,685

SURFACE ACTIVE COMPOUND

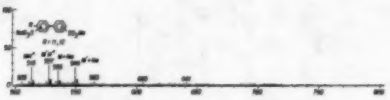
Takazumi Kanekiyo; Yukitoshi Akimoto; Miho Kubota; Koichi Fujita, and Yasunori Koizumi, all of Mie, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Jun. 16, 1989, Ser. No. 367,318

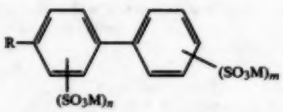
Claims priority, application Japan, Jul. 11, 1988, 62-172177

Int. Cl.[4] B01F *17/12*; C07C *143/24*

U.S. Cl. 252—353 9 Claims



1. An alkylbiphenyldisulfonate represented by formula:



wherein R represents an alkyl group having from 10 to 15 carbon atoms; M represents an alkali metal atom; and m and n each represents 0, 1 or 2, and m+n=2.

4,898,686

ZINC STABILIZATION WITH MODIFIED ACRYLAMIDE BASED POLYMERS AND CORROSION INHIBITION DERIVED THEREFROM

Donald A. Johnson; John E. Hoots; Dodd W. Fong, all of Naperville, and Guy A. Crucil, Bloomingdale, all of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Apr. 27, 1987, Ser. No. 42,927

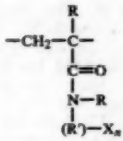
Int. Cl.[4] C23F *11/18, 11/16*

U.S. Cl. 252—389.2 9 Claims

1. A corrosion inhibitor composition comprising:

(a) a water soluble zinc salt; and

(b) a zinc-stabilizing water soluble vinylic terpolymer having a molecular weight ranging between about 2500 to about 85,000, which polymer contains at least five mole percent of a repeating mer unit represented by the formula:



wherein R is chosen individually, at each occurrence, from the group consisting of hydrogen, methyl and ethyl groups;

R′ is a multicovalent hydrocarbonaceous bridging group containing from 1–12 carbon atoms and which be linear alkyl, aryl, cyclic and mixtures thereof; and

X is chosen from the group consisting of —SO_3M, —COOM, and mixtures thereof; and

n ranges from 1–10; and

M is chosen from the group consisting of hydrogen, metallic cations, protonated amines, quaternary amines and mixtures thereof; and which polymer also contains at least ten mole percent of a mer unit chosen from the group consisting of acrylic acid, methacrylic acid, maleic anhydride, maleic acid and mixtures thereof; and further, which polymer also contains at least ten mole percent, of a mer unit chosen from the group consisting of acrylamide, methacrylamide, methyl vinyl ether, ethyl vinyl ether, maleimide, and mixtures thereof; and wherein the ratio of zinc salt(a) to zinc stabilizing polymer(b) ranges between about a:b between about 100:1 and, wherein (a) and (b) are combined with (c) an orthophosphate or orthophosphate source, such that the ratio of a:b:c: ranges between about 10:1:1 to about 1:10:100.

4,898,687

CORROSION INHIBITOR

David C. Parker, Macclesfield, and Brian G. Clubley, Wilmslow, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 9, 1988, Ser. No. 269,085

Claims priority, application United Kingdom, Nov. 21, 1987, 8727323

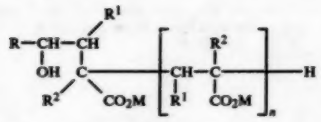
Int. Cl.[4] C09K *15/06*

U.S. Cl. 252—389.61 19 Claims

1. A composition, in contact with a corrodable metal surface, which composition comprises:

(A) an aqueous-based or oil-based system; and

(B) as inhibitor for protecting the metal surface against corrosion, a mixture comprising at least one compound of formula I and at least one compound of formula II:



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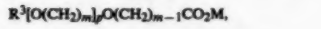
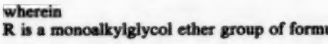


II

wherein

R is a monoalkylglycol ether group of formula III



III

R^1 is H, CO_2M or C_1–C_4 straight or branched chain alkyl residue;

R^2 is H, C_1–C_4 straight or branched chain alkyl residue, $—CH_2CO_2M$ or $—CH_2CH_2CO_2M$;

R^3 is C_4–C_{20} straight or branched chain alkyl residue, C_6–C_{10}aryl residue, C_6–C_{10}aryl residue substituted by C_1–C_{15}alkyl residues, C_5–C_{12}cycloalkyl residue, a C_7–C_{12}aralkyl group, or a C_7–C_{12}aralkyl group substituted by C_1–C_{15}alkyl residues;

n is a number from 0 to 20;

m is a number from 2 to 4;

p is a number from 0 to 20; and

M is a metal ion, hydrogen, an ammonium ion or a substituted ammonium ion.

4,898,688

POLY(2,2,6-TETRAMETHYL PIPERIDYL AMINO)-1,3,5-TRIAZINES AS STABILIZERS FOR SYNTHETIC POLYMER COMPOSITIONS

Yutaka Nakahara, Okegawa, and Etsuo Tobita, Urawa, both of Japan, assignors to Adeka Argus Chemical Co., Ltd., Urawa, Japan

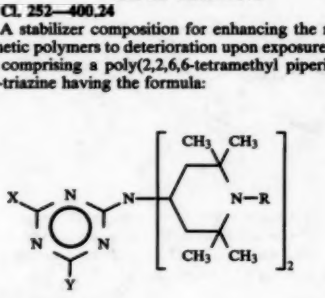
Division of Ser. No. 884,146, Jul. 10, 1986, abandoned. This application Dec. 30, 1987, Ser. No. 139,525

Claims priority, application Japan, Jul. 17, 1985, 60-157727

Int. Cl.[4] C09K *15/18*

U.S. Cl. 252—400.24 **5 Claims**

1. A stabilizer composition for enhancing the resistance of synthetic polymers to deterioration upon exposure to light and heat comprising a poly(2,2,6,6-tetramethyl piperidyl amino)-1,3,5-triazine having the formula:

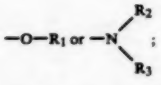


I

in which:

R is selected from the group consisting of hydrogen; alkyl, alkenyl, cycloalkyl, hydroxyalkyl and alkoxy having from one to about twelve carbon atoms; acyl having from about one to about twelve carbon atoms; and oxyl;

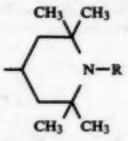
X and Y are each selected from the group consisting of



wherein:

R_1 is selected from the group consisting of alkyl, hydroxyalkyl and alkylenealkoxy having from one to about twelve carbon atoms; cycloalkyl having from three to about twelve carbon atoms; and aryl having from six to about eighteen carbon atoms;

R_2 and R_3 are selected from the group consisting of hydrogen; alkyl having from one to about twelve carbon atoms; cycloalkyl having from three to about twelve carbon atoms; and aryl having from six to about eighteen carbon atoms; and R_2 and R_3 taken together as alkylene in a five to six member ring including the nitrogen atom in the ring; and



and at least one synthetic polymer heat stabilizer selected from the group consisting of phenolic antioxidants, organic phosphites, polyvalent metal salts and thiodipropionic acid esters.

4,898,689

ELECTROCONDUCTIVE SILICONE RUBBER PARTICLES

Mitsuo Hamada, Kisarazu; Koji Shimizu, Ichihara, and Haruki Wakita, Chiba, all of Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Jun. 30, 1988, Ser. No. 213,394

Int. Cl.[4] H01B *1/06*

U.S. Cl. 252—510 **8 Claims**

1. An electroconductive silicone rubber particulate consisting essentially of from 0.5 to 280 parts by weight of an electrically conductive material per 100 parts by weight of silicone rubber and having a particle diameter of from 0.1 to 1000 micrometers.

6. A composition comprising 100 parts by weight of a matrix of silicone rubber in which there is dispersed from 25 to 125 parts by weight of an electroconductive silicone rubber particulate consisting essentially of from 0.5 to 280 parts by weight of an electrically conductive material per 100 parts by weight of the silicone rubber in the particle and has a particle diameter of from 0.1 to 1000 micrometers.

4,898,690

BUBBLE-BATH CONCENTRATE GEL

Ingrid Bitter; Wolfhard Scholz, both of Krefeld, and Werner Schneider, Krefeld-Bockum, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Apr. 28, 1988, Ser. No. 187,108

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1987, 3714455

Int. Cl.[4] C11D *1/14, 1/12*

U.S. Cl. 252—554 **10 Claims**

1. A bubble-bath concentrate gel composition consisting essentially of:

(A) about 35 to 45% by weight of one or more alkyl ether surfactants of the formula R^1-$O(C_2H_4O)_n$-SO_3Na, in which R^1 is a C_{12-16} alkyl and n is 1 to 6;

(B) about 5 to 15% by weight of one or more nonionic polyglycol ether surfactants of the formula R^2-A-$(C_2H_4O)_x$-H, in which R^2 is a C_{12-18} alkyl, alkenyl or acyl, A is oxygen or -NH-, and x is 3 to 9;

(C) about 1 to 5% by weight of one or more amphoteric or zwitterionic surfactants;

(D) about 1 to 5% by weight of one or more glycerol polyglycol ether monofatty acid esters or of fatty acid monoacid or diglyceride polyglycol ethers based on a C_{12-18}

fatty acid containing 5 to 20 glycol ether moieties in either case;
(E) about 2 to 10% by weight of a water-insoluble perfume oil;
(F) water q.s. to 100% by weight; and
(G) 0 to about 5% by weight of standard auxiliaries, additives and mixtures thereof for bubble bath concentrates; all percentages based upon the concentrate as a whole.

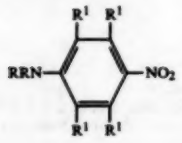
4,898,691

ORGANIC NONLINEAR OPTICAL MEDIA

Marie Borzo, Basking Ridge, and Dagobert E. Stuetz, Watchung, both of N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed May 16, 1988, Ser. No. 194,478
Int. Cl.[4] F21V 9/04; G02B 5/22
U.S. Cl. 252—589 **14 Claims**

1. A nonlinear optical medium consisting of a solid solution of components comprising (1) a thermoplastic acrylate or methacrylate polymer or copolymer; (2) a first organic compound exhibiting nonlinear optical response which corresponds to the formula:



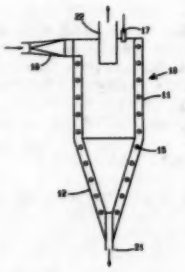
where R is hydrogen or a C_1–C_{20} alkyl substituent, and R^1 is hydrogen or a C_1–C_4 alkyl substituent; and (3) a second organic compound which complexes with and enhances the nonlinear optical response of the first organic compound.

4,898,692

PROCESS FOR DIRECT CONVERSION OF REACTIVE METALS TO GLASS

John B. Rajan; Romesh Kumar, and Donald R. Vissers, all of Naperville, Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 16, 1988, Ser. No. 271,967
Int. Cl.[4] G21F 9/16
U.S. Cl. 252—629 **17 Claims**



1. A one-step process for converting radioactive metal waste into a product suitable for storage, comprising providing a cyclone reactor having means for heating the side walls thereof and an exhaust gas outlet and a glass product outlet, establishing an inlet stream of aspirated radioactive metal waste, establishing an inlet stream of air and silica, mixing the two inlet streams in the cyclone reactor to produce a glass and an off gas, maintaining the side walls of the reactor at a temperature sufficient to permit the glass formed in the reactor to flow along the side walls to the liquid glass outlet, and continuously venting off gas through the exhaust gas outlet.

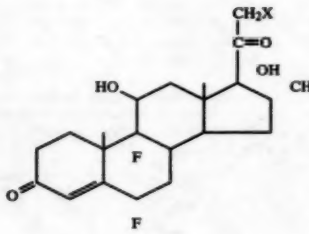
4,898,693

PROCESS FOR PRODUCTION OF 6α,9α-DIFLUORO-11β,17α-DIHYDROXY-16α-METHYL-4-PREGNENE-3,20-DIONE AND ITS DERIVATIVES

Gerhard Hempel, Werne; Mario Kennecke, Berlin; Bernhard Krieger, Unna; Rainer Phillippson, Bergkamen-Mitte; Hermann Triem, Hamm, and Alfred Weber, Berlin, all of Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Nov. 30, 1987, Ser. No. 126,098
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1986, 3640709
Int. Cl.[4] C07J 9/00
U.S. Cl. 260—397.4 **10 Claims**

1. A process for the production of 6α,9α-difluoro-11β,17α-dihydroxy-16α-methyl-4-pregnene-3,20-diones of general formula I



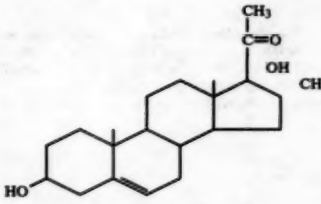
(I)

wherein

symbolizes a single bond or a double bond, and

X is H, Br, I or alkanoyloxy with 1–8 carbon atoms,

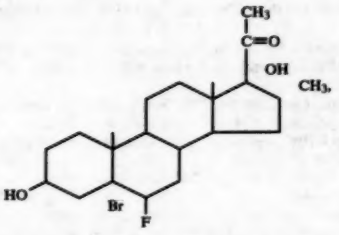
comprising: reacting 3β,17α-dihydroxy-16α-methyl-5-pregnen-20-one of formula II



(II)

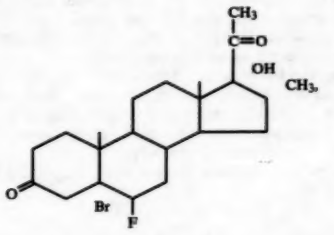
with an N-bromoacylamide and hydrogen fluoride in the presence of urea,

oxidizing the resultant 5α-bromo-6β-fluoro-3β,17α-dihydroxy-16α-methyl-pregnan-20-one of formula III



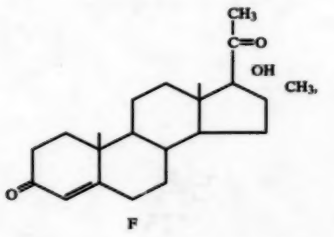
(III)

dehydrobrominating the formed 5α-bromo-6β-fluoro-17β-hydroxy-16α-methyl-pregnane-3,20-dione of formula IV while simultaneously isomerizing the 6-position



(IV)

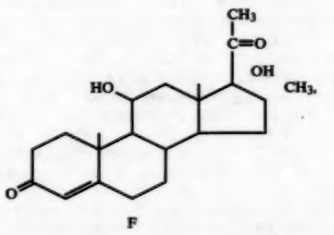
hydroxylating the resultant 6α-fluoro-17α-hydroxy-16α-methyl-4-pregnane-3,20-dione of formula V at the II-position



(V)

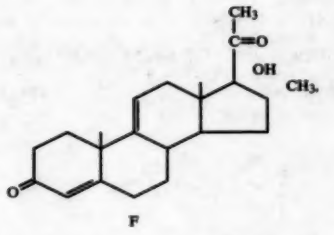
with a live culture of an effective species of the Curvularia type,

dehydrating the thus-produced 6α-fluoro-11β,17α-dihydroxy-16α-methyl-4-pregnene-3,20-dione of formula VI



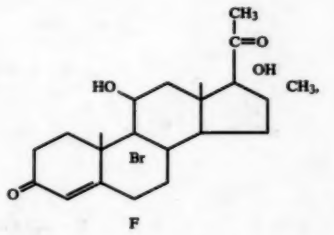
(VI)

adding BrOH to the resultant 6α-fluoro-17α-hydroxy-16α-methyl-4,9, (11)-pregnadiene-3,20-dione of formula VII



(VII)

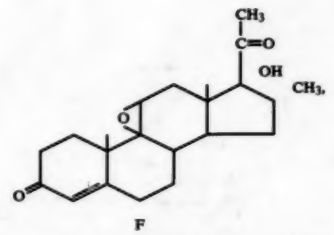
dehydrobrominating the resultant 9α-bromo-6α-fluoro-11β,17α-dihydroxy-16α-methyl-4-pregnene-3,20-dione of formula VIII



(VIII)

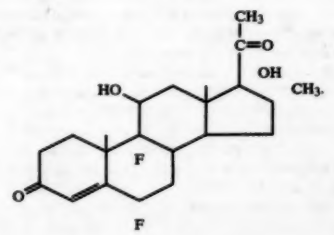
and

opening the epoxide ring of the thus-produced 9,11β-epoxy-6α-fluoro-17α-hydroxy-16α-methyl-4-pregnene-3,20-dione of formula IX



(IX)

with hydrogen fluoride to form 6α,9α-difluoro-11β,17α-dihydroxy-16α-methyl-4-pregnene-3,20-dione of formula Ia



(Ia)

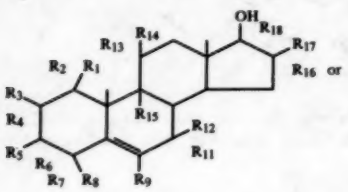
4,898,694

17-HYDROXY-STEROIDS

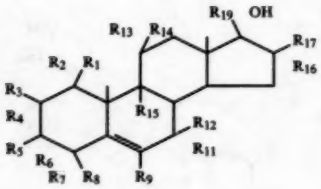
Arthur G. Schwartz, 220 Locust St., Philadelphia, Pa. 19106, and Marvin L. Lewbart, 546 E. Saint Andrews Dr., Media, Pa. 19063

Filed Nov. 25, 1987, Ser. No. 126,369
Int. Cl.[4] C07J *9/00*
U.S. Cl. 260—397.5 **101 Claims**

1. Compounds of the formulae:



or



wherein

R_1, R_2, R_3, R_4, R_7, R_8, R_{11}, R_{12}, R_{13}, R_{14}, R_{15}, and R_{17} are each independently hydrogen, lower alkyl, halogen, or lower alkoxy; R_5 and R_6 are independently hydrogen, lower alkyl or lower alkoxy;

R_{16} is lower alkyl, halogen, or lower alkoxy;

R_9 is hydrogen, lower alkyl or halogen; and

R_{18} and R_{19} are each independently hydrogen, lower alkyl, lower alkenyl, lower alkynyl, formyl, lower alkanoyl or epoxy.

4,898,695

METHOD FOR TINTING HYDROPHILIC PLASTIC ARTICLES

Praful Doshi, Poway, Calif., assignor to Pilkington Visioncare Holdings, Inc., Menlo Park, Calif.

Filed Nov. 1, 1988, Ser. No. 265,523
Int. Cl.[4] B29D *11/00*
U.S. Cl. 264—2.6 **11 Claims**

1. A method for producing a tinted, hyrated contact lens wherein a tinting step is carried out as an in-line step during the process of converting a monomeric, lens forming material to a packaged, fully hydrated contact lens, comprising the steps of:

1. converting the monomeric material to an intermediate contact lens article in the xerogel state;
2. generating at least one optical surface on said article;
3. tinting said article by impregnating the pores of said article with a dispersion of a solubilized vat dye as a precursor at a temperature in the range 35° to 85° degrees Centigrade, rinsing said article, precipitating the vat dye in a water insoluble form in the pores of said article and rinsing said article a second time;
4. drying said article to substantially its former xerogel state;
5. converting said xerogel article to a packaged, fully hydrated contact lens.

4,898,696

CONTINUOUS PREPARATION OF MICROCAPSULES WITH MELAMINE-FORMALDEHYDE CONDENSATE WALLS IN AQUEOUS DISPERSION

Wolfgang Sliwka, Weinheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 902,589, Sep. 2, 1986, abandoned. This application Apr. 18, 1988, Ser. No. 185,265
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1985, 3532878
Int. Cl.[4] B01J *13/02*
U.S. Cl. 264—4.7 **13 Claims**

1. A continuous process for preparing microcapsules encapsulating a hydrophobic material, said microcapsules having melamine-formaldehyde condensate capsule walls, which process comprises condensing a water-soluble melamine-formaldehyde precondensate which is water-miscible in all proportions without turbidity from an initial aqueous solution, comprising said precondensate, said hydrophobic material and 1–5.5%, by weight, based on the aqueous phase, water soluble high polymers containing strongly acid groups,

continuing said condensation of said precondensate until said aqueous solution starts to become turbid,

dispersing the hydrophobic material to be encapsulated in the aqueous dispersion resulting from said initial condensation step, and subsequently completing condensation of said melamine-formaldehyde condensate to form the wall material of the resulting microcapsules,

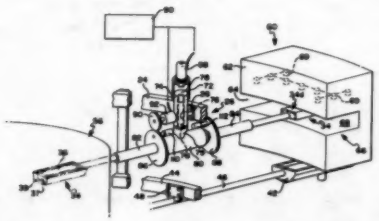
wherein the microcapsules are prepared in a pH 3–6.5 and 15°–100° C.

4,898,697

ROTATIONAL SLUSH MOLDING METHOD

Roger L. Horton, Somersworth, N.H., assignor to Davidson Textron Inc., Dover, N.H.

Filed Dec. 23, 1988, Ser. No. 289,024
Int. Cl.[4] B29C *41/18*; B28B *5/06*
U.S. Cl. 264—37 **4 Claims**



1. A method for forming cured plastisol parts in a process in which a heated mold is initially filled with an excess of plastisol material to form a gel layer thereon and the excess plastisol is returned to a plastisol supply followed by a fusion step wherein the gel material is cured in a curing oven comprising:

providing conveyor means having a plurality of spaced reversing arm assemblies, each arm assembly having opposite ends carrying mold means thereon;

providing first and second conveyor paths for the mold means on the opposite ends of each arm assembly and locating one of the first and second conveyor paths inside the outer perimeter of the other of the first and second conveyor paths;

preheating mold means on one of the arm assemblies on the first conveyor path and filling the preheated mold means with an excessive charge of plastisol into the preheated mold means to form a gel layer thereon while on the first conveyor path and thereafter dumping plastisol from the

preheated mold means for return to a supply source of plastisol;

simultaneously curing a gel layer on mold means on another of the arm assemblies by directing the mold means through the second conveyor path as the preheated mold means on the other end of the arm assembly is being filled and dumped whereby the movement of an arm assembly produces simultaneous filling and curing of mold means on one of the arm assemblies and simultaneous dumping and curing of mold means on another of the arm assemblies.

4,898,698

METHOD OF CASTING A POROUS MEMBRANE OF POLYMERIC MATERIAL

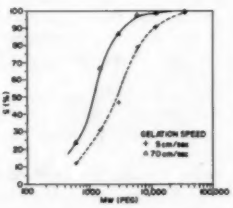
Thomas A. Tweedle, Orleans; Oleh Kutowy, North Gower, and André Tremblay, Vanier, all of Canada, assignors to National Research Concil of Canada, Ottawa, Canada

Filed Dec. 7, 1988, Ser. No. 281,021

Claims priority, application Canada, Dec. 9, 1987, 553861

Int. Cl.[4] B29C *39/42, 67/20*

U.S. Cl. 264—41 **4 Claims**



1. A method of casting a porous membrane of polymeric material, comprising:

(a) casting a layer of a casting solution on to a support to provide a cast layer of the casting solution thereon with an exposed skin, the casting solution comprising

(i) a polymeric material capable of gelation from the casting solution by a gelation liquid to form a porous membrane, and

(ii) an aprotic solvent for the polymeric material, which will be slowly diffused from the casting solution by the gelation liquid, the aprotic solvent having a relatively high exothermic heat of mixing with the gelation liquid and being selected from the group consisting of N-Methyl Pyrrolidinone, Dimethyl Acetamide, Dimethyl Sulfoxide, Dimethyl Formamide and Butyrolactone,

(b) progressively submerging the cast layer in a gelation liquid water at a relative surface velocity between the cast layer and the gelation liquid of at least 15 cm/second, whereby the exposed skin is gently scrubbed with gelation liquid to continuously remove outwardly diffusing solvent therefrom and dissipate exothermic heat evolved by mixing of the diffusing solvent and the gelation liquid,

(c) maintaining the cast layer submerged in the gelation liquid until gelation of substantially the whole cast layer has occurred,

(d) so that rapid entry of the gelation liquid into the cast layer occurs without solvent build-up recurring at the exposed surface, thus causing gelation of at least a stable, coherent active skin layer on the exposed surface of the cast layer, with build-up of a solvent diffusing layer between the exposed surface of the cast layer and the gelation liquid being minimized, whereby a membrane is formed having at least one of the following:

(i) a more homogeneous active skin layer with a lower molecular weight cut off point,

(ii) a more homogeneous active skin layer with a sharper molecular weight cut off,

(iii) a relatively thinner active skin layer with a relatively greater flux for a given separation of a substance from a solution thereof, and

(iv) relatively fewer imperfections throughout an active skin layer.

4,898,699

METHOD FOR BONDING A POROUS METAL LAYER TO A CERMET SURFACE

Hans Hofmann, Muehlheim, and Hartmut Wendt, Dieburg, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 1, 1988, Ser. No. 214,509

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1987, 3721753

Int. Cl.[4] B29C *67/20;* **C04B** *35/00, 35/64, 41/81*

U.S. Cl. 264—43 **21 Claims**

1. A method for bonding a porous metal layer to a cermet surface of a cermet blank to form a cell or bi-polar plate in which the cermet acts as an electrically non-conducting diaphragm and the porous metal layer acts as an electrode, comprising the following steps:

(a) preparing a ceramic component and a metal component for the formation of said cermet blank, said ceramic component being selected as a calcined, milled component from the group consisting of alkaline earth metal oxides, alkaline metal oxides, rare earth metal oxides, amphoteric oxides of Sub-Groups III, IV, V, and VI of the periodic table and any mixture of the just listed group, said metal component being selected in the form of a first reducible metal oxide powder from the group consisting of Sub-Groups I, II and VIII of the period table,

(b) mixing said ceramic component and said first reducible metal oxide powder to form a cermet mixture, wherein said first reducible metal oxide powder is so proportioned that a resulting metal proportion in said cermet blank corresponds to about 5% by weight to about 40% by weight of said cermet blank,

(c) preparing from said cermet mixture a green cermet blank without any supporting metal netting in said green cermet blank,

(d) applying a coating of a second reducible metal oxide including an activating metal to at least one surface of said green cermet blank, and

(e) subjecting said green cermet blank and said coating to a reducing sintering for forming from said first reducible metal oxide powder said metal component of said cermet blank having improved bonding capabilities, and for forming simultaneously from said second metal oxide said porous metal layer effectively bonded to said cermet surface thereby providing said cermet blank with said metal layer bonded thereon, said bonded cermet having high mechanical stability and sufficient flexibility to act as said diaphragm and electrode of said bi-polar plate.

4,898,700

PROCESS FOR PRODUCING PREOXIDIZED FIBERS FROM ACRYLIC FIBERS

Osamu Yoshinari; Yoshifumi Kawakatsu; Hayashi Takahashi, and Hideaki Fukuizumi, all of Shizuoka, Japan, assignors to Toho Rayon Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 883,399, Jul. 8, 1986, abandoned, which is a division of Ser. No. 610,080, May 14, 1984, abandoned. This application Sep. 30, 1988, Ser. No. 252,074

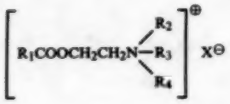
Claims priority, application Japan, May 14, 1983, 58-83483

Int. Cl.[4] D01F *9/22, 11/08*

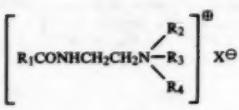
U.S. Cl. 264—83 **27 Claims**

1. A process for producing preoxidized fibers with substantially no fiber coalescence, which comprises preoxidizing acrylic fibers having a fluorine-containing surface active agent and at least one phosphoric surface active agent selected from the group consisting of compounds represented by the follow-

ing formulae (I), (II) and (III), and preoxidizing the acrylic fibers thus-obtained:



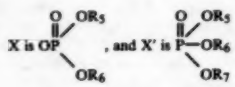
(I)



(II)

$$[R_1CON(CH_2CH_2OH)_2]X' \quad \text{(III)}$$

wherein R_1 represents an aliphatic hydrocarbon group having 1 to 17 carbon atoms, R_2, R_3 and R_4, which may be the same or different, and each represents a hydrogen atom, a lower alkyl group, a hydroxyethyl group or a hydroxyisopropyl group,



wherein R_5, R_6 and R_7, which may the same or different, each represents a hydrogen atom or a hydroxyethyl group, wherein the total amount of the fluorine-containing surface active agent and the phosphoric surface active agent is up to 0.5% by weight based on the total weight of the acrylic fibers and the surface active agents, and wherein the amount of the phosphoric surface active agent is from 30 to 95% by weight based on the total amount of surface active agent.

4,898,701

MANUFACTURE OF SHAPED ARTICLES FROM REFRACTORY POWDER

Alan W. Atkinson, and David N. Smith, both of Rugby, United Kingdom, assignors to T&N Materials Research Limited, Manchester, England

Filed Dec. 30, 1987, Ser. No. 139,762

Claims priority, application United Kingdom, Jan. 23, 1987, 8701538

Int. Cl.[4] C08B *33/13*

U.S. Cl. 264—109 **9 Claims**

1. A method of making phosphate-bonded refractory material in sheet form, comprising the steps of:

(a) mixing a refractory powder of particle size below 200 μm with an aqueous acidic phosphate solution in a proportion such as to form a damp crumbly mass, said mass being free from combustible binder and containing a plasticity-improving clay in an amount up to about 10% by weight of the mass;

(b) subjecting said crumbly mass to high shear by repeatedly passing it through the nip of a twin-roll mill until a cohesive plastic mass adhering to a roll of said mill is formed; and

(c) removing said cohesive plastic mass from the roll as a coherent sheet and hardening said sheet at a temperature below the sintering temperature of the refractory powder and not greater than about 600° C.

4,898,702

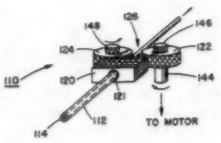
METHOD AND APPARATUS FOR REMOVAL OF A WIRE MANDREL FROM A CATHETER

Jeffrey M. Elkins, Miami Lakes, and Russell F. Collins, Hialeah, both of Fla., assignors to Cordis Corporation, Miami, Fla.

Filed Apr. 4, 1988, Ser. No. 177,062

Int. Cl.[4] B29C *41/42*

U.S. Cl. 264—145 **7 Claims**



1. A method for fabricating a catheter comprising the steps of: extruding a plastic tubular layer over a wire mandrel to a desired thickness to form a catheter; exposing a portion of the mandrel at one end; pushing the exposed portion of the mandrel through a passageway in a body, said passageway having a diameter wide enough to receive the mandrel but not the extrusion;

pushing the exposed end of the mandrel into a nip between two contact wheels; and

turning the wheels, whereby the mandrel is withdrawn from the catheter.

3. An apparatus for removing a wire mandrel from a plastic tubular extrusion to form an elongated catheter, an exposed portion of said mandrel extending beyond one end of the plastic tubular extrusion, comprising:

a body having a throughpassage with a diameter greater than that of the wire mandrel but less than that of the plastic extrusion; and

gripping means for gripping the exposed portion of the mandrel and pulling the mandrel through the body while the body restrains the motion of the plastic tubular extrusion;

said gripping means comprising a pair of rotatably mounted rollers spaced near the throughpassage in the body to form a nip for grasping the exposed end of the mandrel as the mandrel is pushed through the body and pulling the mandrel from the tubular extrusion.

4,898,703

UTILIZATION OF POLYESTER IN PLACE OF LEAD FOR USE AS A SHEATHING MATERIAL FOR CURING LONG LENGTH HOSE

Hoyt M. Wells, Akron, Ohio; William J. Determan, Pierce; Vernon V. Vanis, Norfolk, both of Nebr.; John E. Hrivnak, Clinton; Donald E. Richeson, North Canton, both of Ohio, and Timothy P. Saupe, Madison, Wis., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 7, 1989, Ser. No. 334,500

Int. Cl.[4] B29C *63/18, 35/06*

U.S. Cl. 264—166 **5 Claims**

1. A process for vulcanizing a tubular article comprising the sequential steps of:

(a) extruding about said article a sheath of unoriented polyethylene terephthalate;

(b) quenching such sheath at such a rate as to preclude crystallization;

(c) subjecting said sheath article to a vulcanization temperature sufficient to transform said sheath from an amorphous state to a crystalline state and to vulcanize said article; and

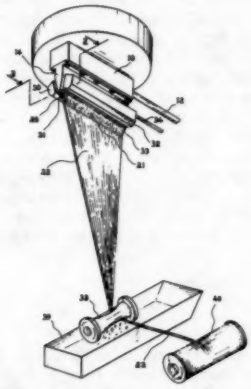
(d) removing said sheath from said article.

4,898,704

COAGULATING PROCESS FOR FILAMENTS

David W. Luckey, Richmond, Va., assignor to E. I. Du Pont De Nemours & Co., Wilmington, Del.

Filed Aug. 30, 1988, Ser. No. 238,109
Int. Cl.[4] D01D 5/06
U.S. Cl. 264—180 6 Claims



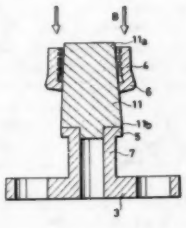
1. A process for preparing filaments from a solution of polymer by extruding the solution through linearly arranged apertures in a spinneret to form a vertical warp of filaments traveling at a first velocity downwardly through an gap, jetting opposed sheets of coagulating liquid at a second velocity from each side of said warp at an angle with said warp to meet at a common line across the width of the warp below the face of the spinneret, each of said sheets of liquid being wider than said warp at said common line, said second velocity having a vertically downward component that is from about 20% to about 99% of said first velocity.

4,898,705

METHOD FOR PRODUCING SYNTHETIC RESIN UNION JOINT

Junsuke Kyomen; Masayuki Sakaguchi, both of Sakai, and Hiroto Fujii, Kawachinagano, all of Japan, assignors to Kubotatekko Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 803,051, Nov. 15, 1985, abandoned. This application May 16, 1988, Ser. No. 194,529
Int. Cl.[4] B29C 55/24, 57/06
U.S. Cl. 264—242 2 Claims



1. A method for producing a synthetic resin union joint, which method comprises:

forming a union nut having a flange part and a screw portion and forming a union sleeve, said union sleeve having a union swivel end and a connecting end;

heating a length portion of said union nut at least equal to a thickness dimension of said flange part but not extending to said screw portion so as to elastically soften said length of said union nut;

abutting one end of a truncated cone-shaped expansion guide with an end face of said union swivel end such that an outer diameter of said guide substantially corresponds with an outer diameter of said union swivel end;

shifting and enlarging said length of said union nut along said expansion guide so as to pass over said union swivel end and so that said union nut passes over said guide; and

returning said length of said union nut to its original configuration due to a restoring force of an elastically softenable state so as to be positioned between said union swivel end and said connecting end; and

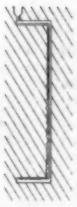
removing said expansion guide from engagement with said union swivel end.

4,898,706

PROCESS FOR PRODUCING MOLDED ARTICLES WITH UNEVEN PATTERN

Seizo Yabe, Tokyo, and Kunio Yamazaki, Osaka, both of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Oct. 6, 1988, Ser. No. 253,638
Claims priority, application Japan, Oct. 7, 1987, 62-251650
Int. Cl.[4] B29C 45/14
U.S. Cl. 264—266 3 Claims



1. A process for producing a synthetic resin molded article having a pattern formed on its uneven surface, which comprises fitting a patterned film or sheet to a mold and injecting a thermoplastic resin, wherein said mold has engraved therein a sharp unevenness such that said patterned film or sheet undergoes extension of from 5 to 120% upon resin injection, said patterned film or sheet is a polycarbonate film or sheet having a thickness of from 0.3 to 1 mm, and said polycarbonate film or sheet has formed a pattern on its side to be in contact with the engraved side of the mold so that the pattern does not directly contact the injected resin.

4,898,707

METHOD AND APPARATUS FOR GUSSETED PARISON DRAPING

George F. Arp, Rochester, N.Y., assignor to John D. Brush & Co., Inc., Rochester, N.Y.

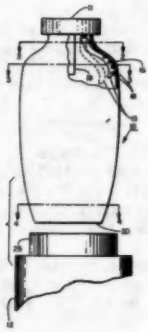
Filed Dec. 23, 1988, Ser. No. 289,318
Int. Cl.[4] B29C 49/04, 49/30, 49/50
U.S. Cl. 264—515 10 Claims

1. A method of draping a generally cylindrical parison around a generally rectangular mold core arranged within a generally rectangular mold cavity as said parison lowers from an extrusion head, so that said parison can be blown against surfaces of said cavity and said core, said draping method comprising:

a. preforming said parison into a generally rectangular shape having opposed side and end walls, said preforming being accomplished by passing said parison over a spreader arranged under and proximate to said extrusion head to form said parison internally into corner regions of said

generally rectangular shape as said parison descends from said extrusion head;

b. as an open bottom end of said generally rectangular parison descends into proximity with an open mold clamp arranged on said rectangular mold core, directing a jet of air downwardly through said open bottom end to draw said side and end walls of said generally rectangular parison inward relative to said corner regions in a bottom region of said parison;



c. clamping said inwardly drawn side and end walls of said bottom region of said parison by closing said clamp against said bottom region of said parison to form a pleat in each of said end walls as said bottom region is folded to extend along said clamp;

d. further lowering said clamped parison so that said parison drapes around said rectangular core mold and said pleats unfold into gussets and extend toward corners of said rectangular mold core; and

e. closing said cavity and blowing said parison against said core and said cavity.

4,898,708

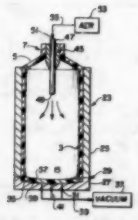
METHOD FOR SHAPING CLOSED BOTTOM OF TUBULAR CONTAINER

George H. Holoubek; John J. Rhoades, both of Muscatine, Iowa, and George P. Whitaker, Triadelphia, W. Va., assignors to Wheeling Stamping Company, Wheeling, W. Va.

Continuation of Ser. No. 859,475, May 2, 1986, abandoned. This application Jul. 21, 1988, Ser. No. 222,387

Int. Cl.[4] B29C *49/22, 49/04*

U.S. Cl. 264—515 **23 Claims**



1. A method for producing a tubular thermoplastic container having an open neck at one end and a sealed bottom wall at the other end comprising:

forming an extruded tubular wall section of a substantially uniform wall thickness;

forming a narrow open neck section at one end thereof;

applying a thermoplastic disc at the other end thereof, said thermoplastic disc welded at its peripheral edge to the circumferential wall at said other end of the tubular wall section to close said other end, with said thermoplastic disc being in a moldable state; then,

placing said closed end, and at least a major portion of the tubular wall section, into a mold sleeve having a closed bottom cavity with said at least major portion of said tubular wall section in close proximity to said mold sleeve and said disc adjacent said closed bottom cavity; and

forming said thermoplastic disc, while the same is still in a moldable state, to cause the disc to conform in shape to said closed bottom cavity to form said sealed bottom wall, while maintaining said substantially uniform wall thickness and said extruded shape of said tubular wall portion in close proximity to said mold sleeve, said forming of said thermoplastic disc occurring by application of vacuum to the exterior surface of said disc, or by application of fluid pressure to the interior confines of the tubular wall section and closed bottom, or by a combination of both exterior vacuum and internal fluid pressure has been inserted after "sleeve".

4,898,709

ORE IRRADIATOR

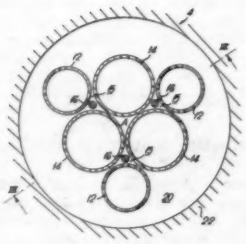
Colin G. Clayton, Abingdon, England, assignor to United Kingdom Atomic Energy Authority, London, England

Continuation of Ser. No. 678,565, Oct. 26, 1984, abandoned. This application Jul. 20, 1987, Ser. No. 75,213

Claims priority, application United Kingdom, Apr. 22, 1983, 8310991

Int. Cl.[4] G21G *1/06*

U.S. Cl. 376—159 **15 Claims**



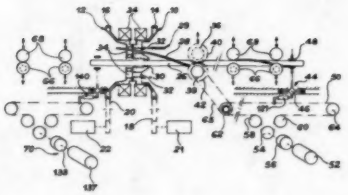
1. An irradiator for irradiating lumps of ore for detecting the presence of a selected substance in the lumps, the irradiator comprising a plurality of cylindrical ducts (**12, 14**) through which, in operation, lumps of ore are caused to pass, and means for rotating each duct about its longitudinal axis, characterised in that the ducts are arranged in a close-packed array so as to define roughly triangular spaces (**15**) between the ducts, each said space being defined by walls of three adjacent ducts, with clearance between neighboring ducts sufficient to allow rotation of the ducts, and that a plurality of neutron sources (**16**) for irradiating the ducts are provided, at least some of the roughly triangular spaces between the ducts having a said neutron source therein so that each duct is adjacent to at least one source, some of the ducts being adjacent to, and so in use irradiated by, more than one neutron source, the other ducts being adjacent to one source, the former ducts being of greater cross-sectional area than the latter, each source comprising a target, and means to generate a high energy particle beam incident onto the target in a direction substantially parallel to the longitudinal axes of the ducts, and of such an energy that in operation neutrons bring about excitation of atoms of the selected substance in the lumps.

4,898,710

MACHINE FOR REMOVING THE SPACING WIRE OF NUCLEAR FUEL RODS

Jean Colas, Bagnols sur Ceze, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Nov. 30, 1988, Ser. No. 278,023
Claims priority, application France, Dec. 7, 1987, 87 16979
Int. Cl.[4] G21C *19/33, 19/36*
U.S. Cl. 376—261 **15 Claims**



1. Machine for removing the spacing wire (**28**) of a nuclear fuel rod (**26**), the wire (**28**) being helically wound around the rod (**26**) and the latter being substantially cylindrical, characterized in that the machine comprises:

a first and a second rotary parts (**10, 12**) rotatable about the same axis and having in each case:

a front face (**11,15**),

a rear face (**13, 17**), the front face of the second rotary part (**12**) being substantially in contact with the rear face of the first (**10**),

a central passage (**72, 74**) along which it is possible for said rod (**26**) to pass, said passage (**72, 74**) having an inlet on the front face and an outlet on the rear face and having a substantially cylindrical shape, whose axis coincides with the said rotation axis and

a series of holes (**32, 34**) through each of which the wire (**28**) can pass, said holes (**32, 34**) being further than the central passage (**72, 74**) from the rotation axis and having an inlet on the front face and an outlet on the rear face, the arrangement being such that the outlet of one hole (**32**) of the first rotary part (**10**) can coincide at least partly with the inlet of a hole (**34**) of the second rotary part (**12**),

means for rotating the first rotary part (**10**),

means for rotating the second rotary part (**12**), and

means (**44**) for the displacement in translation of the rod (**26**) along its axis to make it pass through the central passages (**72, 74**) of the rotary parts (**10, 12**).

4,898,711

POWDER METAL MIRROR

Donald W. Burt, Manhattan Beach, and Gerald A. Hans, Woodland Hills, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 25, 1988, Ser. No. 223,982
Int. Cl.[4] B22F *3/26*
U.S. Cl. 419—27 **16 Claims**

1. A process for preparing, from metallurgical powders, a mirror having at least one mirror face with an optical quality reflective surface thereon, comprising the steps of:

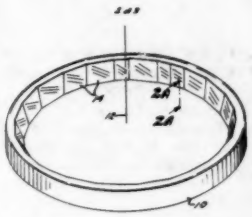
forming from metallurgical powders a first precursor of a final mirror, the first precursor being powder in a form having the general shape of the final mirror but being larger in size than the final mirror;

pressing the first precursor with a tool to consolidate the powder material and to define the mirror face, thereby forming a first intermediate precursor of the mirror;

sintering the first intermediate precursor to form a second intermediate precursor;

repressing the second intermediate precursor to form a third intermediate precursor, in a first repressing step, with a tool having an optical quality tool face contacting the mirror face, the tool face that contacts the mirror face moving at an acute angle relative to the mirror face;

annealing the third intermediate precursor;



repressing the annealed third intermediate precursor, in a second repressing step, with a tool having an optical quality tool face contacting the mirror face, the tool face moving at an acute angle relative to the mirror face; and

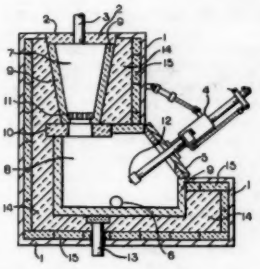
coating the mirror face of the repressed third intermediate precursor with a metallic coating.

4,898,712

TWO-STAGE FERROSILICON SMELTING PROCESS

Vishu D. Dosaj; James B. May, both of Midland, Mich., and Robert D. Jeffress, Palo Alto, Calif., assignors to Dow Corning Corporation, Midland, Mich.

Filed Mar. 20, 1989, Ser. No. 325,850
Int. Cl.[4] C22C *33/00*
U.S. Cl. 420—578 **28 Claims**



1. A process for preparing ferrosilicon in a closed two-stage furnace, the first stage of the furnace containing an energy source and the second stage being attached to the first stage by a means suitable for retaining solid particles in the second stage and allowing gases from the first stage to pass through the contained particles, said process comprising:

a. combining into the first stage of the furnace a feed mixture consisting essentially of a source of iron, a source of carbon, and silicon dioxide;

b. loading the second stage of the furnace with particles containing higher oxides of iron;

c. applying energy to the first stage sufficient to effect conversion of the feed mixture to molten silicon and iron and to gaseous carbon monoxide; the gaseous carbon monoxide contacting the particles contained in the second stage and reducing the higher oxides of iron;

d. recovering the molten silicon and iron from the first stage as a ferrosilicon alloy;

e. loading the reduced higher oxides of iron formed in the second stage, along with silicon dioxide and a source of carbon to the first stage;

f. loading the second stage of the furnace with particles containing higher oxides of iron;

g. repeating steps c through f.

4,898,713

PROCESS FOR STERILIZING A TIGHT ENCLOSURE AND INSTALLATION FOR PERFORMING THIS PROCESS

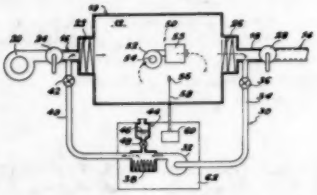
Claude Picard, Nanterre, France, assignor to Societe Nouvelle d'Exploitation La Calhene, Velizy-Villa coublay, France

Filed Mar. 10, 1988, Ser. No. 166,366

Claims priority, application France, Mar. 30, 1987, 87 04393

Int. Cl.[4] A61L *2/20, 2/24*

U.S. Cl. 422—3 **7 Claims**



1. Process for the sterilization of a tight enclosure having a closed volume and equipped with a ventilation and filtration circuit, which circuit has a supply pipe with a supply filter and a discharge pipe with a discharge filter, the supply pipe and the discharge pipe each connected to the tight enclosure defining the closed volume, the steps of the process comprising in order:

(a) closing the ventilation and filtration circuit upstream of the supply filter and downstream of the discharge filter;

(b) while the ventilation and filtration circuit remains closed:

I. drying the closed volume defined by the tight enclosure until a given lower relative humidity is obtained;

II. introducing a sterilizing agent into the closed volume until a given higher relative humidity is obtained, the sterilizing agent being introduced by using a closed circuit connected to the supply pipe upstream of the supply filter and to the discharge pipe downstream of the discharge filter;

III. sterilizing the closed volume by maintaining the sterilizing agent in the closed volume for given contact time; and

(c) scavenging the closed volume by opening and using the ventilation and filtration circuit, and wherein the drying of the closed volume is accomplished by circulating the atmosphere within said volume through a drying means which is located within the closed volume.

4,898,714

MIXING APPARATUS

Franz Urban, Rohrdorf/Thansau, and Adolf Bauer, Olching, both of Fed. Rep. of Germany, assignors to Krauss-Maffei AG, Münich, Fed. Rep. of Germany

Filed Aug. 10, 1987, Ser. No. 83,338

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1986, 3626990

Int. Cl.[4] B01F *5/02, 15/02;* **B29B** *7/76*

U.S. Cl. 422—133 **8 Claims**

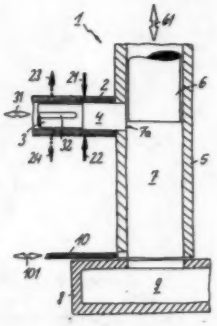
1. An impingement mixing device comprising:

a mixing chamber housing;

a control piston axially displaceable within said mixing chamber housing between an extended position and a retracted position;

a mixing chamber within said housing defined by an end face of said control piston when in the retracted position and a mixing chamber discharge outlet coextensive with an end face of said control piston when in the extended position;

means to feed a first component to said mixing chamber;



means to feed a second component to said mixing chamber in opposing relationship to said first component; and

a discharge tube housing defining a quieting chamber communicating with said mixing chamber and having an opening at a discharge end, means for at least partially closing said opening of said quieting chamber at said discharge end.

4,898,715

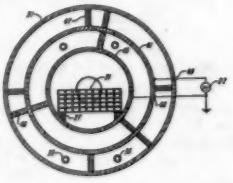
PROCESS AND APPARATUS FOR DRY STERILIZATION OF MEDICAL DEVICES AND MATERIALS

Adir Jacob, 23 Juniper La., Framingham, Mass. 01701

Division of Ser. No. 19,134, Feb. 25, 1987, Pat. No. 4,801,427. This application Nov. 22, 1988, Ser. No. 275,324

Int. Cl.[4] B01J *19/08, 19/12*

U.S. Cl. 422—186.29 **2 Claims**



1. Apparatus for sterilization of medical devices and materials in a gas plasma comprising,

a gas confining chamber formed with a generally cylindrical metallic wall,

a perforated metallic cylinder positioned within said chamber generally concentric with said generally cylindrical chamber wall,

means for electrically connecting said chamber wall to a point of potential reference,

means for applying an RF voltage between said perforated cylinder and said point of potential reference,

means for evacuating said gas-confining chamber, and

means for flowing gas through said chamber.

4,898,716

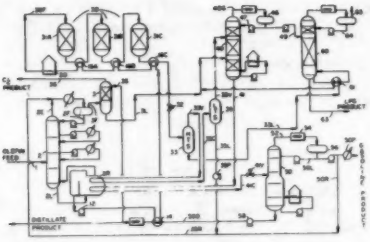
OLEFIN FRACTIONATION AND CATALYTIC CONVERSION SYSTEM

Chung H. Hsia, Matawan; Hartley Owen, Belle Mead, and Bernard S. Wright, East Windsor, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 616,376, Jun. 1, 1984, Pat. No. 4,504,691, which is a continuation-in-part of Ser. No. 508,959, Jun. 29, 1983, Pat. No. 4,497,147, and a continuation-in-part of Ser. No. 508,907, Jun. 29, 1983, Pat. No. 4,450,311. This application Jan. 14, 1985, Ser. No. 691,304

Int. Cl.[4] B01D *3/14*; B01J *8/04*

U.S. Cl. 422—190 **9 Claims**



1. A system for converting lower olefins to heavier hydrocarbons from olefinic feedstock comprising a mix comprising:

prefractionation means for recovering light feedgas from the olefinic feedstock including a stripper tower operatively connected to strip said light feed gas from heavier hydrocarbons selectively;

means for recovering a liquid stripper bottoms stream from the prefractionator;

reactor means containing oligomerization catalyst for converting lower olefins contained in the stripper bottoms stream to higher molecular weight hydrocarbons comprising intermediate and heavy hydrocarbons;

means for flashing at least a portion of the reactor effluent stream between the reactor means and a phase separator by reducing pressure of the effluent stream, thereby producing a first liquid effluent stream rich in heavy hydrocarbons and a first effluent vapor stream rich in light hydrocarbons;

means for recovering a liquid recycle stream rich in intermediate hydrocarbons from at least one of said separated effluent streams;

means for recycling substantially all of the liquid recycle stream as a liquid sorbent stream to the prefractionation means.

4,898,717

MULTISTAGE PROCESS FOR CONVERTING OXYGENATES TO DISTILLATE HYDROCARBONS WITH INTERSTAGE ETHENE RECOVERY

Chung H. Hsia, Matawan; Hartley Owen, Belle Mead, and Bernard S. Wright, East Windson, all of N.J., assignors to Mobil Oil Corp., New York, N.Y.

Division of Ser. No. 568,152, Jan. 4, 1984, Pat. No. 4,506,106. This application Jan. 7, 1985, Ser. No. 689,638

Int. Cl.[4] B01D *3/14*; B01J *8/04*

U.S. Cl. 422—190 **7 Claims**

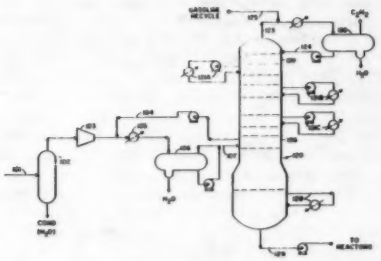
1. A continuous multi-stage catalytic system for converting oxygenated feedstock to liquid hydrocarbons comprising primary stage catalytic dehydration means containing catalyst for converting oxygenate to light olefinic vapor and normally liquid C_5+ hydrocarbons;

interstage separation means for recovering water and hydrocarbons from the primary stage effluent stream;

first fractionation means for recovering ethene from the primary stage olefinic vapor including a sorption tower operatively connected to selectively sorb C_3+ hydrocarbons from the olefinic vapor in a liquid sorption stream;

means for pressurizing and heating the liquid sorption stream containing C_3+ sorbate;

secondary stage catalytic oligomerization reactor means containing medium pore shape selective zeolite oligomerization catalyst for converting olefinic hydrocarbons in



the sorption stream to liquid hydrocarbons comprising a major amount of distillate;

second fractionation means for separating secondary stage effluent into a light hydrocarbon stream rich in C_3–C_4 aliphatic hydrocarbons, a C_5+ gasoline stream and distillate range stream; and

means for recycling at least a portion of the C_5+ gasoline stream to the first fractionation means as a lean sorbent stream.

4,898,718

BIOCATALYTIC REACTORS FOR GEL-LIKE AND OTHER TYPES OF IMMOBILIZED BIOCATALYSTS

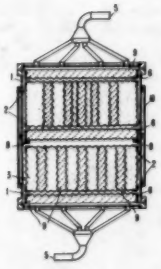
Joaquim P. Cardoso, Sacavem, Portugal, assignor to Cipan-Companhia Industrial Produtora De Antibioticos, S. A., Lisbon, Portugal

Filed Mar. 2, 1987, Ser. No. 20,772

Claims priority, application Portugal, Mar. 19, 1986, 82225

Int. Cl.[4] B01J *8/02*

U.S. Cl. 422—211 **13 Claims**



1. A biocatalytic reactor for contacting a liquid with a particulate catalyst comprising:

(a) a column having an inlet and an outlet for said liquid, and

(b) at least one catalyst containing box inside said column between said inlet and said outlet and extending across the interior of said column, said box having a top end and a bottom end and defined by a wire mesh covering suitable to prevent the catalyst from escaping the box and allowing the free passage of the liquid through it, means defining a plurality of separate voids each free of catalyst material

and extending from the bottom end to the top end of said box and defined by wire mesh on their lateral area and top and bottom cross sectional areas.

4,898,719

LIQUID EXTRACTION PROCEDURE FOR THE RECOVERY OF SCANDIUM

William J. Rourke, Worcester; Wen-Chao Lai, Westboro, and Samuel Natansohn, Sharon, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Continuation of Ser. No. 41,815, Apr. 23, 1987, abandoned. This application Mar. 10, 1989, Ser. No. 321,603

Int. Cl.[4] C01F *17/00*

U.S. Cl. 423—21.5 **7 Claims**

1. A method for recovering scandium comprising the following steps:

Step 1—dissolving scandium from a solid comprising iron, manganese, and scandium to form an aqueous solution comprising an amount of said scandium, and said iron, said amount of said iron in said aqueous solution being greater than said amount of said scandium in said solution;

Step 2—reducing any ferric iron in said aqueous solution containing said scandium;

Step 3—adjusting the product from step 2 containing said scandium to an acidic pH from about 1.8 to about 2.0 to form an acidic solution;

Step 4—selectively extracting said scandium with respect to iron from said acidic solution by contacting said acidic solution with an organic mixture forming an organic mixture containing said scandium, said organic mixture comprising an organic extractant and an organic solvent, said organic extractant comprising thenoyltrifluoroacetone;

Step 5—contacting said organic mixture containing said scandium with an aqueous stripping solution to transfer said scandium contained in said organic mixture to said aqueous stripping solution, said stripping solution comprising a mineral acid;

Step 6—precipitating said scandium contained in said aqueous stripping solution; and

Step 7—separating said precipitated scandium from said aqueous stripping solution.

4,898,720

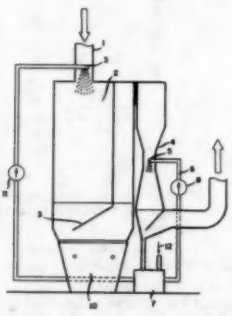
METHOD FOR GASCLEANING AND A DEVICE FOR THE ACCOMPLISHMENT OF THE METHOD

Per Glindsjö, Nygatan 136, SE-602, 31 Norrköping, Sweden

Filed Apr. 18, 1988, Ser. No. 182,451

Int. Cl.[4] B01D *47/00*

U.S. Cl. 423—210 **13 Claims**



11. A method for gascleaning comprising the steps of feeding dirty gas into an inlet of a gas reactor;

flowing the dirty gas around an edge of a deflection plate mounted at a bottom of a wall inside the gas reactor;

feeding the dirty gas from the deflection sheet to a venturi pipe;

spraying water into the venturi pipe at a constriction;

collecting the water from the venturi pipe in a tank;

pumping the water in the tank with a pump to the nozzle in the venturi pipe;

pumping water from the tank with a second pump to a second nozzle disposed at the top of the gas reactor.

4,898,721

HALOGEN ABSORBTION USING VEGETABLE OILS AND SURFACTANTS

Robert M. Alway, 2830 Radcliffe, Portage, Mich. 49081

Filed Apr. 4, 1989, Ser. No. 332,972

Int. Cl.[4] B01D *53/34;* B08B *3/04*

U.S. Cl. 423—240 **5 Claims**

1. A process of absorbing halogens comprising; contacting a mixture containing vegetable oil and surfactant with halogen, pure or mixed with other material.

4,898,722

SYNTHESIS OF CRYSTALLINE SAPO-37

Eric G. Derouane, Namur, Belgium, and Roland von Ballmoos, Pennington, N.J., assignors to Mobil Oil Corp., New York, N.Y.

Filed Dec. 19, 1984, Ser. No. 683,785

The portion of the term of this patent subsequent to Jun. 16, 2004, has been disclaimed.

Int. Cl.[4] C01B *33/28*

U.S. Cl. 423—328 **7 Claims**

1. A method for synthsizing crystalline material comprising silicon, phosphorus and aluminum and exhibiting a characteristic X-ray diffraction pattern as shown in Table I of the specification which comprises:

(1) providing a reaction mixture comprising water, sources of the said oxide, silicon oxide, and phosphorus oxide, one of the said oxide sources being unstable in the water, an organic directing agent A, wherein said organic directing agent A is a mixture of tetrapropylammonium and tetramethylammonium, inorganic cations M and anions N, and a substantially water-immiscible organic solvent for the said oxide source unstable in the water, the components of said reaction mixture having the following relationship:

$$(A)_a(M_2O)_b(Al_2O_3)_c(SiO_2)_d(P_2O_5)_e(\text{Solvent})_fN_g(H_2O)_h$$

wherein a, b, c, d, e, f, g, and h are numbers satisfying the following relationship:

a/(c+d+e) is less than 4,

b/(c+d+e) is less than 2

d/(c+e) is less than 2,

f/(c+d+e) is from 0.1 to 15,

g/(c+d+e) is less than 2, and

h/(c+d+e) is from 3 to 150,

wherein upon initial provision of said reaction mixture the said oxide source unstable in the water is dispersed or dissolved in the water-immioscible organic solvent;

(2) heating said reaction mixture at a rate of from 5° C. to 200° C. per hour to a temperature of from 80° C. to 200° C.;

(3) agitating said reaction mixture in a manner sufficient to intimately admix the water-immiscible organic solvent and the water with each other thereby progressively hydrolyzing the oxide source unstable in water;

(4) when nucleation of said crystalline material occurs, heating said agitated reaction mixture at a rate of from 5° C. to 200° C. per hour to a temperature of from 100° C. to 300° C.;

(5) maintaining said agitated reaction mixture at a tempera-

ture of from 100° C. to 300° C. and a pH of from 2 to 9 until crystals of said crystalline material are formed; and

(6) recovering from said reaction mixture said crystalline material characterized by a composition, in the anhydrous state, as follows:

$$A_v'{:}M_{x/m}^{m+}{:}(AlO_2)_{1-y}^{-}{:}(PO_2)_{1-x}^{+}{:}(SiO_2)_{x+y}{:}N_{y/n}^{n-}$$

wherein A' represents the total of organic directing agent A plus water-immiscible organic solvent, v is the number of moles of A', m is the valence of cation M, n is the valence of anion N, and x and y are numbers of from greater than −1 to less than +1 which satisfy the relationship:

(1) if x is 0, then y is not 0,

(2) if y is 0, then x is not 0,

(3) the sum of x+y is greater than 0 and less than 1,

said crystalline material having an ion exchange capacity of at least about 0.05 meq/g.

4,898,723

METHOD FOR PRODUCING HIGH STRENGTH, HIGH MODULUS MESOPHASE-PITCH BASED CARBON FIBERS

Yoshinori Suto; Toshiyuki Ito; Hideyuki Nakajima; Keiichiro Okamura; Shin-ichi Nayuki, all of Kamisumachi; Hiroyasu Ogawa, and Harumitsu Enomoto, both of Shizuokaken, all of Japan, assignors to Petoca Ltd., Tokyo, Japan

Filed Jun. 3, 1988, Ser. No. 202,851

Claims priority, application Japan, Jun. 5, 1987, 62-139979

Int. Cl.[4] D01F *9/12*

U.S. Cl. 423—447.4 **1 Claim**

1. A method for producing mesophase pitch based carbon fibers which comprises carbonizing infusiblized fibers, obtained by treating mesophase-pitch-fibers, in an inert atmosphere under no tension or under a tension of 1 mg/denier or less in a first stage until an interlayer spacing d 002 of 0.3460–0.3490 nm and a crystallite thickness L_c (002) of 1.6–2.2 nm are attained and then carbonizing under a tension of 50–300 mg/denier at the temperature of 2600° C. or more in the second stage.

4,898,724

ORGANIS AMINE PHOSPHONIC ACID COMPLEXES FOR THE TREATMENT OF CALCIFIC TUMORS

Jaime Simon, Angleton; David A. Wilson, Richwood, both of Tex.; Wynn A. Volkert; David E. Troutner, both of Columbia, Mo., and William F. Goeckeler, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 803,376, Dec. 4, 1985, abandoned, which is a continuation-in-part of Ser. No. 738,010, May 28, 1985, abandoned, which is a continuation-in-part of Ser. No. 616,985, Jun. 4, 1984, abandoned. This application May 14, 1987, Ser. No. 50,263

Int. Cl.[4] A61K *43/00, 49/02;* A61N *5/10;* C07F *11/00*

U.S. Cl. 424—1.1 **26 Claims**

1. A composition comprising (1) a complex which comprises Sm-153 and at least one of an aminophosphonic acid or a physiologically acceptable salt thereof wherein the aminophosphonic acid is selected from the group consisting of ethylenediaminetetramethylenephosphonic acid, diethylenetriaminepentamethylenephosphonic acid, hydroxyethylethylenediaminetrimethylenephosphonic acid, tris(2-aminoethyl)aminehexamethylenephosphonic acid, bis(aminoethyl)-piperazinetetramethylenephosphonic acid, and (1-carboxy)ethylenediaminetetramethylenephosphonic acid and (2) at least one of the above aminophosphonic acids, or a physiologically acceptable salt thereof, in excess of that required to make the complex, and wherein the resulting composition is therapeutically effective.

4,898,725

PREPARATIONS FOR WASHING OR RINSING HAIR CONTAINING DI- OR TRI- CARBOXYLIC ACIDS

Horst Hoeffkes, Duesseldorf-Hellerhof; Kurt Seidel, Duesseldorf; Karl Giede; Alfred Struve, both of Hilden, and Bert Gruber, Duesseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 822,368, Jan. 24, 1986, abandoned. This application Sep. 20, 1988, Ser. No. 248,344

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1985, 3503618

Int. Cl.[4] A61K *7/075, 7/080;* C11D *3/20*

U.S. Cl. 424—70 **12 Claims**

1. An aqueous or aqueous-alcoholic composition for washing or rinsing hair, comprising

A. from about 0.1 to about 5.0% by weight of at least one water soluble ionic polymer, and

B. from about 0.1 to about 20% by weight of a water-soluble salt of a saturated or unsaturated aliphatic, alicyclic or aromatic di- or tri-carboxylic acid containing from 6 to 44 carbon atoms wherein two of its carboxyl groups are separated from one another by at least 3 carbon atoms.

4,898,726

INITIATED HAIR STRAIGHTENING COMPOSITION AND SYSTEM

Marion D. Beste, Arlington Heights, Ill., assignor to Johnson Products Co., Inc., Chicago, Ill.

Filed Aug. 24, 1988, Ser. No. 236,054

Int. Cl.[4] A61K *7/09;* A45D *7/04*

U.S. Cl. 424—72 **42 Claims**

1. An initiated, aqueous, no-base type hair-straightening composition having a pH of between 12 and about 14 comprising a mixture of a strong alkali as a hair-straightening agent and a water-soluble initiating agent that is a mercapto dicarboxylic acid hair keratin-disulfide reducing agent selected from the group consisting of aliphatic dicarboxylic acids having about 4 to about 6 carbon atoms and a sulfhydryl functional group on a carbon atom alpha to one or both of the carboxy acid groups, salts thereof and derivatives thereof.

4,898,727

DEODORANT AND FILTER USING SAME, AS WELL AS METHOD OF PRODUCING THE DEODORANT

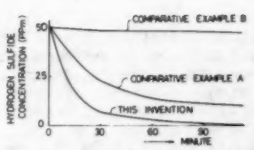
Koji Ossda, Yawata; Haruyuki Date, Sakai; Yasuhiro Salhara, Kadoma; Toshiyuki Yamauchi, Ibaragi, and Shiro Koike, Shijonawate, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jun. 25, 1986, Ser. No. 878,324

Claims priority, application Japan, Oct. 15, 1985, 60-230424

Int. Cl.[4] A61L *9/01;* C07H *1/08*

U.S. Cl. 424—76.1 **12 Claims**



1. A deodorant consisting essentially of deodorizing ingredients extracted by hydrophilic organic solvents, water, or mixtures thereof from at least one plant selected from the group consisting of Osmanthus, Forsythia, Paulownia, Syringa, Diospyros, Quercus, Fartugium, Petasites, Pinus, Tsuga, Ginkgo, Nandina, Loropetalum, Houttuynia, and Oxalis, and a carrier impregnated with said deodorizing ingredients.

4,898,728

PROCESS FOR PRODUCTION OF COMPOSITION CONTAINING LECITHIN AND POLYVINYLPYRROLIDONE

Robert R. Vartan, Bristol, Tenn., assignor to Beecham Group p.l.c., England

Filed Apr. 7, 1988, Ser. No. 178,487
Int. Cl.[4] A61K *31/79, 31/74, 31/43*
U.S. Cl. 424—80 10 Claims

1. In a process for the production of a sterile composition containing lecithin and polyvinyl pyrrolidone the improvement comprising admixing the lecithin and polyvinyl pyrrolidone, in a solvent comprising about 75% to 90% methyl isobutyl ketone and about 10% to 25% isopropyl alcohol, and passing the solution through a millipore filter whereby the ingredients are rendered sterile.

4,898,729

TREATMENT OF HYPERTENSION, COMPOUNDS AND COMPOSITIONS FOR ANTIHYPERTENSION AND DIURESIS

Ronald B. Miller, Harpenden, England; Alfred Halpern, Great Neck, N.Y.; Stewart Leslie, Cambridge, England, and Peter Hofer, Liestal, Switzerland, assignors to Euroceltique, S.A., Luxembourg, Luxembourg

Filed Dec. 9, 1983, Ser. No. 559,755
Int. Cl.[4] A61K *31/79*
U.S. Cl. 424—80 30 Claims

1. Method of effecting antihypertensive action without diureses which comprises administering to a patient requiring antihypertensive effect but in whom diureses is not desired a pharmaceutically acceptable thiazide diuretic having a predetermined diuretic effective dose, the amount of said thiazide diuretic administered being sufficient to achieve antihypertension while being insufficient to achieve effective diuresis.

4,898,730

METHOD TO STIMULATE THE IMMUNE RESPONSE TO SPECIFIC ANTIGENS

Julia G. Levy, Vancouver; J. Kevin Steele, Victoria, and Anthea T. Stammers, Port Coquitlan, all of Canada, assignors to The University of British Columbia, Vancouver, Canada

Filed Mar. 13, 1987, Ser. No. 25,463
Int. Cl.[4] A61K *39/00, 45/02, 37/02*
U.S. Cl. 424—88 5 Claims

1. A method to enhance the immune response to a specified antigen which comprises administering to a mammal in need of such treatment at a time prior to exposure to said antigen effective to enhance immune response upon exposure to said antigen, an amount of an idiotypic factor secreted by Ts1 cells (TsF1) immunoreactive with the antigen effective to enhance said immune response.

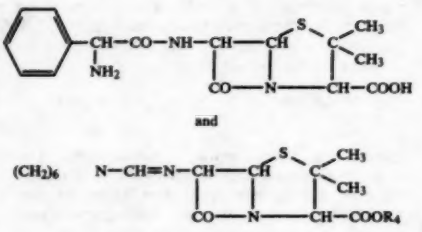
4,898,731

ANTIBIOTIC COMBINATIONS OF PENICILLINS

Peter Bamberg, Zurich, Switzerland; Bertil A. Ekström, Södertälje, Sweden; Ulf E. Forsgren, Södertälje, Sweden, and Berndt O. H. Sjöberg, Södertälje, Sweden, assignors to Astra Lakemedel Aktiebolag and Astra Pharmaceutical Products, Inc., both of, Sweden

Division of Ser. No. 464,157, Apr. 25, 1974, abandoned, which is a continuation-in-part of Ser. No. 302,423, Oct. 31, 1972, abandoned. This application Jun. 24, 1985, Ser. No. 748,268
Claims priority, application United Kingdom, Nov. 1, 1971, 50675/71
Int. Cl.[4] A61K *31/43*
U.S. Cl. 424—114 2 Claims

1. A method of treating bacterial infections in a body which comprises forming an antibacterially effective 1:1 mixture of:



and

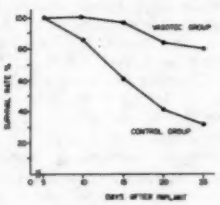
in the body.

4,898,732

INHIBITING OF TUMOR GROWTH WITH AN ANTAGONIST OF THE RENIN-ANGIOTEN-SIN SYSTEM

Leonardo A. Fernandez, Guilford, Conn., assignor to The Clinipad Corporation, Guilford, Conn.

Filed May 4, 1988, Ser. No. 190,158
Int. Cl.[4] A61F *13/00*
U.S. Cl. 424—422 7 Claims



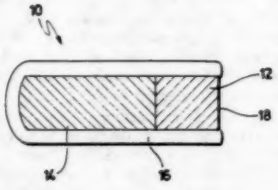
1. The method of implanting in a patient a controlled-release member, said member containing and releasing in controlled manner an effective dose a member selected from the group consisting of enalapril maleate, catapril and seralasin acetate, of a pharmaceutical antagonist of the renin-angiotensin system of said patient, whereby the growth of vascularization in said patient at least in an area adjacent said implanted controlled-release member is inhibited.

4,898,733

LAYERED, COMPRESSION MOLDED DEVICE FOR THE SUSTAINED RELEASE OF A BENEFICIAL AGENT

Randolph B. DePrince, and Ravi Viswanathan, both of Terre Haute, Ind., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Nov. 4, 1985, Ser. No. 794,530
Int. Cl.[4] A61F *2/00*
U.S. Cl. 424—425 24 Claims



1. A partially coated device for the continuous administra-

tion of a beneficial agent in the body of a living being at a substantially steady rate which comprises:

(a) a body fluid-contacting layer which comprises a dispersion of an agent which is substantially soluble in body fluid and a solid matrix material, said matrix material comprising a polymer which is substantially insoluble in said body fluid, and

(b) a non-body fluid-contacting layer which comprises a reservoir of said beneficial agent, wherein said body fluid-contacting layer is compression molded to said non-body fluid-contacting layer to form a tablet or pellet.

4,898,734

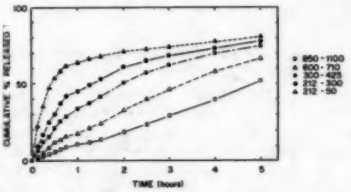
POLYMER COMPOSITE FOR CONTROLLED RELEASE OR MEMBRANE FORMATION

Edith Mathiowitz, Brookline; Robert S. Langer, Somerville, both of Mass.; Abraham Warshawsky, Rehovot, Israel, and Elazar Edelman, Brookline, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Feb. 29, 1988, Ser. No. 162,161

Int. Cl.[4] A61F *2/00*

U.S. Cl. 424—426 **16 Claims**



1. A method for making a composite polymeric device comprising:

providing a compound to be released,

incorporating the compound to be released into polymer spheres,

mixing the polymer spheres into a liquified polymer matrix, and

solidifying the polymer matrix.

4,898,735

LIPOSOME/DOXORUBICIN COMPOSITION AND METHOD

Yechezkel Barenholz, Jerusalem, Israel, and Alberto Gabizon, San Francisco, Calif., assignors to Yissum Research and Development Company of the Hebrew University of Jerusalem and Hadassah Medical Organization, both of, Israel

Continuation-in-part of Ser. No. 806,084, Dec. 6, 1985, Pat. No. 4,797,285. This application Oct. 12, 1988, Ser. No. 256,844

Int. Cl.[4] A01N *25/00*; A61K *31/65*

U.S. Cl. 424—450 **2 Claims**

1. A method of treating human neoplasms of the liver, with at least the same extent of therapeutic effectiveness, but substantially reduced incidence of alopecia and nausea with respect to that produced treatment with doxorubicin in free form, comprising

preparing, for parenteral administration, an aqueous suspension of liposomes (i) whose lipid bilayer region contains at least about 2.5 mole percent doxorubicin or a pharmacologically acceptable salt thereof, and (ii) which are in the size range of 0.05 to 0.5 microns in diameter, allowing for sterilization by membrane, and which suspension contains less than about 10% doxorubicin in free-drug form; and

parenterally administering a pharmacologically acceptable amount of the suspension to the patient.

2. The method of claim 1, wherein the liposomes are about 0.2 microns in diameter.

4,898,736

METHOD FOR TABLET PREPARATION

Ashok V. Katdare, Norristown, Pa., assignor to Merck & Co., Inc., Rayway, N.J.

Filed Mar. 9, 1988, Ser. No. 166,078

Int. Cl.[4] A61K *9/20*

U.S. Cl. 424—465 **2 Claims**

1. A process for the preparation of low dose (2S,12bS)-1',3'-dimethylspiro(1,3,4,6,7,12b-hexahydro-benzo-[2,3-a]quinolizin)-2,4'-(5',6'-dihydro-1'H-pyrimidine-2'(3'H)-one) tablets comprising the steps: dissolving (2S,12bS)-1',3'-dimethylspiro(1,3,4,6,7,12b-hexahydrobenzo]2,3-a]quinolizin)-2,4'-(5',6'-dihydro-1'H-pyrimidine-2'(3'H)-one) in a suitable easily evaporated solvent; mixing the solution with a directly compressible powder tableting vehicle; evaporating the solvent; adding a lubricant and other excipients if desired; and compressing the mixture into tablets.

4,898,737

CONTROLLED ABSORPTION PHARMACEUTICAL COMPOSITION

Donald E. Panoz, and Edward J. Geoghegan, both of Athlone, Ireland, assignors to Elan Corporation plc, Athlone, Ireland

Continuation of Ser. No. 32,996, Mar. 30, 1987, abandoned, which is a continuation of Ser. No. 598,191, Apr. 9, 1984, abandoned. This application Apr. 27, 1988, Ser. No. 188,090

Claims priority, application Ireland, Apr. 21, 1983, 915/83

Int. Cl.[4] A61K *9/16, 9/52*

U.S. Cl. 424—468 **16 Claims**

1. A controlled absorption propranolol containing pellet for oral administration, said pellet comprising:

(A) a core of

(i) a powder mixture comprising propranolol or a pharmaceutically acceptable salt thereof and an organic acid selected from the group consisting of citric acid, tartaric acid, succinic acid, malic acid, ascorbic acid and fumaric acid or a mixture thereof, and

(ii) a polymeric material comprising a major proportion of a pharmaceutically acceptable water-soluble polymer and a minor proportion of a pharmaceutically acceptable water-insoluble polymer,

said core comprising layers of said powder mixture and said polymeric material superimposed one upon the other wherein said polymeric material is present in an amount sufficient to ensure that all of said powder mixture is coated into said core; and

(B) a multi-layer membrane surrounding said core and containing a major proportion of a pharmaceutically acceptable film forming, water-insoluble polymer and a minor proportion of a pharmaceuticaly acceptable film forming, water-soluble polymer,

the number of layers in said membrane and the ratio of said water-insoluble polymer to said water-soluble polymer being effective to permit release of said propranolol

from said pellet at a rate allowing controlled absorption thereof over a twenty four hour period following oral administration, said rate being measured in vitro as a dissolution rate of said pellet in a buffer solution at pH 7.5 which, when measured in a basket assembly according to U.S. Pharmacopoeia XX at 37° C. and 75 r.p.m., substantially corresponds to the following dissolution pattern:

(a) from 0 to 15% of the total propranolol is released after 2 hours of measurement in said assembly;

(b) from 15 to 30% of the total propranolol is released after 4 hours of measurement in said assembly;

(c) from 43 to 63% of the total propranolol is released after 6 hours of measurement in said assembly;

(d) from 75 to 100% of the total propranolol is released after 8 hours of measurement in said assembly;

(e) from 85 to 100% of the total propranolol is released after 10 hours of measurement in said assembly.

4,898,738

PROCESS FOR PRODUCING VINEGAR FROM NON-COOKED ALCOHOL MOROMI

Takehiko Yamamoto, Izumi; Terumasa Kubota, Toyohashi; Isao Itoh, Kashihara; Hiroyuki Kato, Isoki; Terumi Kikuchi, Toride; Hiroko Kawasaki; Misako Mashimoto, both of Saksi, and Yuji Oki, Higashi-Osaka, all of Japan, assignors to Tamanoi Vinegar Corporation Limited, Osaka, Japan

Continuation of Ser. No. 111,798, Oct. 22, 1987, abandoned. This application May 4, 1989, Ser. No. 348,085

Claims priority, application Japan, Dec. 22, 1986, 61-305858

Int. Cl.[4] C12J *1/00, 1/04*

U.S. Cl. 426—17 **3 Claims**

1. A process for producing vinegar from non-cooked alcohol MOROMI derived from corn, which comprises:

pulverizing corn which has not undergone heat denaturation,

adding water in an amount from 2.0 to 7.0 times by volume to the pulverized corn, then adding a glucoamylase preparation containing from 8 to 15 units of glucoamylase activity per 1 gram of starch in the pulverized corn and from 0 to 35 units of protease activity per 1 gram of starch in the pulverized corn and yeast to the pulverized corn,

conducting alcoholic fermentation of raw starch material in the pulverized corn,

separating the resultant solid content from the resultant liquid solution containing alcohol, and

conducting acetic acid fermentation of the separated liquid solution by means of acetic acid bacteria,

wherein said process is conducted in the absence of malt.

4,898,739

PROCESS FOR PREPARING "NON-BITTER" ENZYME MODIFIED CHEESE FLAVORING MATERIAL AND SPRAY DRIED PRODUCT

Anandaraman Subramaniam, Syracuse; Robert M. Ozogar, Mattydale, and Carlton K. Bergsbaken, Syracuse, all of N.Y., assignors to Borden, Inc., Columbus, Ohio

Division of Ser. No. 43,317, Apr. 28, 1987, Pat. No. 4,853,232. This application Apr. 11, 1989, Ser. No. 336,502

Int. Cl.[4] A23C *9/12, 19/086*

U.S. Cl. 426—35 **8 Claims**

1. A process for preparing a non-bitter flavoring material that can be eaten as is or added to foodstuff to impart a cheese flavor to the foodstuff comprising

(a) digesting at a pH between 4.5 and 4.9 a mixture of softened cheese "having at least 60% by weight solids" and purified microbial coagulase until said mixture thins;

(b) inactivating said coagulase; and

(c) homogenizing.

4,898,740

PACKAGE CONTAINING A WATER-IN-OIL FAT DISPERSION

Alfred G. Havenstein, Schenefeld; Werner Kahle, Pinneberg, and Dagmar Schnell, Hamburg, all of Fed. Rep. of Germany, assignors to Lever Brothers Company, New York, N.Y.

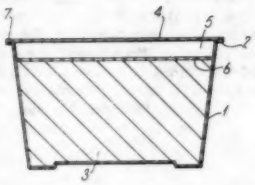
PCT No. PCT/EP87/00188, § 371 Date Dec. 1, 1987, § 102(e) Date Dec. 1, 1987, PCT Pub. No. WO87/05886, PCT Pub. Date Oct. 8, 1987

PCT Filed Apr. 3, 1987, Ser. No. 130,384

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1986, 3611276

Int. Cl.[4] A23D *3/04, 5/04*

U.S. Cl. 426—106 **6 Claims**



1. A package having walls containing a plastified water-in-oil dispersion, at least a surface of which that is not in contact with the walls of the package, said package comprising a thin coating that is a closed, substantially pore-free, edible fat layer not containing a discontinuous aqueous phase, a greater part of the fat layer having a fat of melting point below 37° C., which layer is generally imperceptible and said layer has a non-aqueous, physiologically acceptable filling agent dispersed therein in an amount of 8 to 20%, said filling agent being a gas selected from the group consisting of nitrogen, inert nitrogen oxides, carbon dioxide and mixtures thereof.

4,898,741

METHOD FOR THAWING OF FOOD ARTICLES

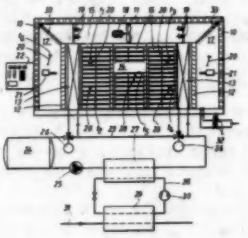
Jan B. Heide, Kristiansund, Norway, assignor to Skärhamn International AB, Göteborg, Sweden

Filed Jun. 21, 1988, Ser. No. 209,383

Claims priority, application Sweden, Jun. 30, 1987, 8702696

Int. Cl.[4] A23B *4/06*

U.S. Cl. 426—231 **4 Claims**



1. A method for thawing of articles of food which have been frozen and stored at a temperature of about −38° C., comprising placing the articles in a room having means for maintaining a controlled humid climate and a maximum air flow of about 5 m/sec, and automatically regulating the thawing process via temperature detector means within the core of the articles and humidity detector means within the humid climate.

4,898,742

PROCESS FOR THE DECHARACTERIZATION OF BASE WINE

Anil J. Shrikhande, Farmington, Conn., and Joseph A. Alioto, Madera, Calif., assignors to Heublein, Inc., Farmington, Conn.

Filed Mar. 2, 1987, Ser. No. 21,050
Int. Cl.[4] C12G 3/08
U.S. Cl. 426—271 4 Claims

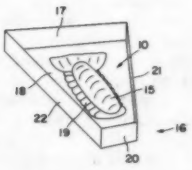
1. A process for treating wine which comprises:
(a) decharacterizing the wine by subjecting the wine to the effects of a non-ionic absorbent selected from the group consisting of phenolic resins and polyaromatic resins;
(b) fortifying the decharacterized wine to contain between 18 and 24 percent of alcohol by volume; and
(c) neutralizing the fortified wine by subjecting the fortified wine to the effects of activated carbon.

4,898,743

METHOD OF COOKING LOBSTER

Richard E. Ross, and Shelley D. Ross, both of 5240 Westside Rd., Redding, Calif. 96001

Filed Aug. 31, 1988, Ser. No. 239,529
Int. Cl.[4] A23L 1/33
U.S. Cl. 426—523 3 Claims



1. A method of cooking lobster, comprising:
cutting a lobster shell having lobster meat therein to facilitate removal of said lobster meat therefrom;
removing said lobster meat from said lobster shell;
positioning said lobster meat atop said lobster shell;
placing said lobster shell and said lobster meat into a cooking pan having a bottom and sides extending upward from said bottom, said bottom and sides being shaped, positioned and oriented such that when said lobster shell is positioned against said bottom of said cooking pan and said lobster meat is positioned atop said lobster shell, said lobster meat is positioned in close proximity to all of said sides of said cooking pan, and
heating said cooking pan to cause reradiation of heat from said sides of said cooking pan toward said lobster meat whereby said lobster meat is substantially evenly cooked.

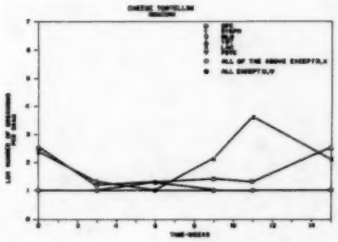
4,898,744

METHOD FOR PREPARING AND PRESERVING FILLED PASTA PRODUCTS

Louis Liggett, Brooklyn; Michael McGuire, Elmhurst; Marcia Palmer, Nanuet, and Ralph DeGiacomo, Palisades, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Dec. 22, 1987, Ser. No. 136,891
Int. Cl.[4] D21D 2/08; A23L 3/00, 1/162
U.S. Cl. 426—557 10 Claims

1. A method for preparing and preserving filled dough product in the form of a filled fresh pasta shell which maintains the freshness for up to 120 days without lowering the moisture to levels which prohibit growth of organisms which cause deterioration comprising the steps of:
(a) preparing a uniform blend comprising flour, water and whole eggs having a moisture content of up to 33%;
(b) conditioning the uniform blend by compacting same to form a sheet of dough having a thickness of at least 0.04 inches;
(c) forming and filling the sheeted dough with a filling composition having a pH ranging from 4.5 to 6.0 selected depending on the end product desired;
(d) contacting the filled dough with steam in a single steam treatment for a time and at a temperature sufficient to pasteurize said filled dough;



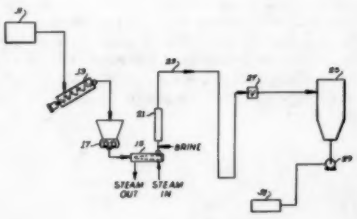
(e) cooling the pasteurized filled dough shell to temperatures between about 30° F. and 50° F.;
(f) packaging the cooled pasteurized filled dough in a modified atmosphere environment; and
(g) storing the packaged product for extended periods of time at temperatures ranging from about 40° F. to about 50° F.

4,898,745

METHOD FOR MANUFACTURING OF PASTA FILATA CHEESE WITH EXTENDED SHELF LIFE

William H. Zamzow, Glenview, and Anthony M. Miller, Northbrook, both of Ill., assignors to Kraft, Inc., Glenview, Ill.

Filed May 25, 1989, Ser. No. 357,057
Int. Cl.[4] A23C 19/06
U.S. Cl. 426—582 11 Claims



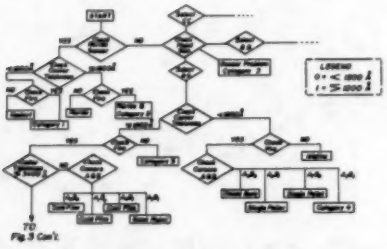
1. A method for making Pasta Filata cheese comprising providing a Pasta Filata curd, dividing said curd into pieces, delivering said curd pieces to an auger conveyor, heating and working said curd to a plastic consistency as it passes through said conveyor, transporting said plastic curd through a steam injection heating zone and a static mixing zone to provide a homogeneous molten curd, transferring said molten curd from said mixer through a holding conduit into a vacuum chamber so as to flash cool said molten curd, said holding conduit having a diameter and length sufficient to hold said molten curd for a time at the temperature of said molten curd which is sufficient to pasteurize said curd and said conduit having an inner wall surface formed of a material with enhanced lubricity as compared to stainless steel.

4,898,746

MATERIAL DEPOSITION PROCESS ANALYSIS SYSTEM

Stephen T. Opresko, Lancaster, Pa., assignor to RCA Licensing Corporation, Princeton, N.J.

Filed Jun. 28, 1988, Ser. No. 213,214
Int. Cl.[4] B05D 5/06
U.S. Cl. 427—10 **2 Claims**



1. A method for depositing an aluminum coating on a phosphor screen of a CRT faceplate panel, comprising the steps of:
   a. loading said panel onto an identified exhaust cart having an evacuation chamber with an apparatus therein for controlling the distribution of aluminum from at least one source on said apparatus;
   b. evacuating said chamber to a pressure sufficient to deposit aluminum;
   c. providing aluminum from said source and depositing aluminum as a coating on said phosphor screen of said panel;
   d. sensing the providing of said aluminum from said source;
   e. generating a plurality of electrical signals representative of the relative thickness of said aluminum coating at the center and the edges on said panel; and
   f. converting said signals into data values to indicate whether said aluminum coating achieves a predetermined thickness profile and utilizing said data values to provide an indication of the performance of said identified exhaust cart and of the categories of defects for said panel not meeting said predetermined thickness profile.

4,898,747

ELECTROSTATIC COATING OF RUBBER-TO-METAL ADHESIVES ON METAL PARTS

Kenneth L. Robertson, Ottawa Hills, Ohio, assignor to Ken-Koat, Inc., Delta, Ohio

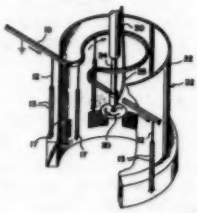
Continuation of Ser. No. 178,804, Mar. 29, 1988, Pat. No. 4,810,521, which is a continuation of Ser. No. 885,623, Jul. 15, 1986, abandoned. This application Nov. 21, 1988, Ser. No. 274,118
Int. Cl.[4] B05D 1/04, 1/06, 3/02, 5/00
U.S. Cl. 427—31 **7 Claims**

1. The process of treating metal parts for bonding of rubber thereto by the application of a rubber-to-metal adhesive thereon, comprising the steps of

providing a plurality of metal parts,

conveying said parts through a disc-type electrostatic applicator while applying a first rubber-to-metal adhesive coating having a low solids content of less than about 40 wt. % solids thereon, said coating being diluted with a petroleum diluent adapted to increase the polarity of said adhesive and having a relatively slow evaporation rate so that the adhesive is applied in a liquid form,

conveying said parts to a drying oven for curing,



conveying said parts from said oven to a second disc-type electrostatic applicator,

applying a second rubber-to-metal adhesive having a low solids content of less than about 40 wt. % solids by said second applicator, said second adhesive being diluted by a petroleum diluent adapted to increase the polarity of said second adhesive and having a relatively slow evaporation rate so that said second adhesive is applied in a liquid form to said parts, and

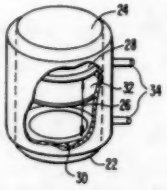
reconveying said parts to said drying oven for drying said second adhesive.

4,898,748

METHOD FOR ENHANCING CHEMICAL REACTIVITY IN THERMAL PLASMA PROCESSES

Charles H. Kruger, Jr., Stanford, Calif., assignor to The Board of Trustees of Leland Stanford Junior University, Stanford, Calif.

Filed Aug. 31, 1988, Ser. No. 239,122
Int. Cl.[4] B05D 3/06
U.S. Cl. 427—38 **16 Claims**



1. A method for enhancing a chemical reaction during which a multiatomic reactant dissociates, comprising:

providing a plasma having an initial gas temperature and an initial electron temperature in a reaction zone, the initial gas temperature and the initial electron temperature being the same or within less than about 1,000° Kelvin of each other, the plasma including at least one multiatomic species; and,

elevating the electron temperature of the plasma in the reaction zone by at least about 1,000° Kelvin above the initial electron temperature and the initial gas temperature to increase the dissociation of the multiatomic species or

to inhibit recombination of the multiatomic species when dissociated.

4,898,749

METHOD FOR PRODUCING ALUMINUM OXIDE COATED COBALT POWDER

Joseph E. Ritsko, Towanda, Pa.; Walter A. Johnson, Houghton, Mich., and Nelson E. Kopatz, Sayre, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jan. 3, 1989, Ser. No. 292,715
Int. Cl.[4] B05D 7/00
U.S. Cl. 427—216 **6 Claims**

1. A method for producing aluminum oxide coated cobalt powder, said method comprising:

(a) contacting cobalt powder of fine particle size with a liquid aluminum compound wherein the aluminum is hydrolyzable and adding water to said compound and said cobalt powder to form a slurry;

(b) removing essentially all of the liquid from said slurry to produce cobalt powder with a coating of hydrolyzed aluminum oxide; and

(c) firing said cobalt powder with said hydrolyzed aluminum oxide coating in a non-oxidizing atmosphere to produce cobalt powder with a coating of aluminum oxide.

4,898,750

PROCESSES FOR FORMING AND USING PARTICLES COATED WITH A RESIN WHICH IS RESISTANT TO HIGH TEMPERATURE AND HIGH PH AQUEOUS ENVIRONMENTS

Robert H. Friedman, and Billy W. Surles, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 5, 1988, Ser. No. 280,066
Int. Cl.[4] B05D 7/00
U.S. Cl. 427—221 **22 Claims**

1. A process for preparing particulate matter coated with a cured, alkaline fluid resistant resin comprising:

(a) contacting particulate matter with a mixture of effective amounts of urea formaldehyde resin and a furfural oligomer resin;

(b) mixing the particulate matter and resins sufficiently to coat the particulate matter uniformly with a resin;

(c) contacting the resin-coated particulate matter with an aqueous solution of surfactant and an acid catalyst for the resin;

(d) mixing the resin-coated particulate matter and aqueous solution of acid and surfactant at a speed sufficient to form a foam; and

(e) allowing the mixture of resin coated particulate matter and the foaming aqueous acid and surfactant fluid to stand for a period of time sufficient to cause polymerization of the resin on the resin coated particulate matter.

(f) cleaning the residual acid and surfactant fluid from the surface of the particulate matter; and

(g) heating the resin coated particulate matter to a temperature of from 300°0 F. to 350° F. for a period of time sufficient to cure the resin to a state at which the particulate matter will not stick together.

4,898,751

COMPOSITION AND METHOD FOR PREVENTION OF ADHESION OF PARTICULATE MATTER TO CONTAINERS

Shailesh G. Dwivedy, St. Louis, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 371,874, Apr. 26, 1982, abandoned. This application Apr. 14, 1986, Ser. No. 851,647
Int. Cl.[4] B05D 7/22; C08L 91/06
U.S. Cl. 427—230 **4 Claims**

1. A composition useful in coating surfaces to inhibit or prevent solid particulates from adhering to such surfaces which comprises a polymeric poly-α-olefin wax and a resin in a hydrocarbon solvent, the weight ratio of poly-α-olefin wax to resin being from about 1:2 to about 2:1.

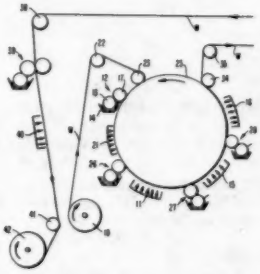
3. A method of inhibiting or preventing solid particulates from adhering to surfaces which comprises coating such surfaces with a composition comprising a polymeric poly-α-olefin wax and a resin in a hydrocarbon solvent, the weight ratio of poly-α-olefin wax to resin being from about 1:2 to about 2:1.

4,898,752

METHOD FOR MAKING COATED AND PRINTED PACKAGING MATERIAL ON A PRINTING PRESS

Giancarlo A. Cavagna, Silver Spring, Md.; Ernest J. Groome, Charleston, S.C.; Joseph M. Murphy, Springfield, Mass., and Domenick L. Raschella, Midlothian, Va., assignors to Westvaco Corporation, New York, N.Y.

Filed Mar. 30, 1988, Ser. No. 175,249
Int. Cl.[4] B05D 3/02, 3/12, 5/00, 7/00
U.S. Cl. 427—265 **7 Claims**



1. The process of manufacturing outer packaging material on a web fed printing press having a plurality of printing stations comprising the steps of:

(a) selecting a web of unbleached paper board having surfaces that are smooth, well sealed and strong;

(b) feeding said web to a printing press having a plurality of printing stations;

(c) applying a coating formulation comprising temperature insensitive binders selected from the group consisting of polyvinylacetate, styrene butadiene and acrylics, and mixtures thereof, and pigments selected from the group consisting of clay, titanium dioxide and calcium carbonate, and mixtures thereof, having a binder-to-pigment ratio of from about 20–25 parts binder to 100 parts pigment, a viscosity of from about 7–11 seconds measured by a No. 3 Zahn cup, and a solids content of between about 50–60% to at least one surface of said web at selected printing stations on said press in increments of about 1–1.5 lbs./1000 square feed to achieve a total coat weight of at least about 2 lbs./1000 square feet;

(d) drying said coated surface after each coating application; and

(e) printing high quality graphics on the coated surface of said web at subsequent printing stations on said printing press.

4,898,753

PROCESS FOR THE PREPARATION OF AROMATIC POLYIMIDE FILM

Hiroshi Inoue; Tadao Muramatsu; Yasuji Narahara, and Tetsuji Hirano, all of Hirakata, Japan, assignors to UBE Industries, Ltd., Ube, Japan

Filed May 26, 1988, Ser. No. 199,330
Claims priority, application Japan, May 29, 1987, 62-136365
Int. Cl.[4] B05D *3/02, 5/00*
U.S. Cl. 427—276 25 Claims

1. A process for the preparation of an aromatic polyimide film having a surface provided with protrusions having an average diameter of 40 to 2,000 angstroms, the number of protrusions being in the range of 1×10^4 to $1\times10^9/mm^2$, which comprises the steps of coating an aromatic polyamic acid solution containing inorganic particles having an average diameter of not larger than 1,000 angstroms on at least one surface of an aromatic polyimide gel film containing a volatile material in an amount of 10 to 90 wt. %, said aromatic polyimide gel film having been obtained by ring closure and imidation of an aromatic polyamic acid in an organic polar solvent containing a dehydrating agent and a catalyst at a temperature of not higher than 200° C. to form a composite of said gel film having a coated surface containing said inorganic particles; drying said film composite at a temperature of 50° to 200° C.; and heat treating the dried film composite at a temperature of not lower than 300° C. to form said polyimide film having said surface protrusions.

4,898,754

POLY(AMIDE-IMIDE) PREPREG AND COMPOSITE PROCESSING

Stephen Christensen, Woodinville, Wash.; Jay O. Rakel, Warrenville, Ill., and Dale E. Hartz, Kent, Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 913,287, Sep. 30, 1986, abandoned. This application May 5, 1988, Ser. No. 190,531
Int. Cl.[4] B29D *9/00*
U.S. Cl. 427—369 10 Claims

1. A method of making and treating a pre-impregnated fiber reinforced poly(amide-imide) material, comprising the steps of:

impregnating a fibrous reinforcing material with a poly(amide-imide) resin dissolved in an organic solvent to form a prepreg, said poly(amide-imide) resin being heat fusible at an elevated temperature that is above the boiling point of said solvent;

drying the prepreg at a temperature of less than 550°–650° F. until approximately 4%, by weight, of the solvent remains;

elevating the temperature of said prepreg to an elevated temperature in the range of about 550°–650° F., said elevated temperature being substantially above the boiling point of the solvent and being approximately equal to the temperature where said resin begins to advance in molecular weight;

maintaining said elevated temperature for approximately 1 to 5 minutes such that said solvent substantially completely evaporates from said prepreg; and

reducing the temperature of said prepreg before the resin advances in molecular weight sufficiently to cause a substantial adverse effect on consolidatability,

wherein after the step of reducing the temperature of the prepreg, the prepreg has a substantially reduced solvent content, and is heat fusible to form a composite article having a glass transition temperature that is about that of the pure poly(amide-imide) resin.

4,898,755

INORGANIC-ORGANIC COMPOSITE COMPOSITIONS EXHIBITING NONLINEAR OPTICAL RESPONSE

Tessie M. Che, Westfield; Dagobert E. Stuetz, Watchung; Alan Buckley, Berkeley Heights, all of N.J., and Donald R. Ulrich, Alexandria, Va., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Division of Ser. No. 15,759, Apr. 17, 1987, Pat. No. 4,814,211. This application Oct. 24, 1988, Ser. No. 261,583
Int. Cl.[4] B05D *3/02*
U.S. Cl. 427—389.7 6 Claims

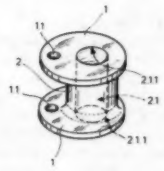
1. A process for producing a composite composition comprising a homogeneous inorganic oxide glass monolith with a microporous structure containing an organic component which exhibits nonlinear optical response, which comprises hydrolyzing tetraalkoxysilane under acidic or basic pH conditions in a sol-gel reaction medium comprising water, a water-miscible organic solvent and an organic component which exhibits nonlinear optical response, until gellation of the reaction medium is completed, and removing the solvent medium to provide a porous glass monolith with incorporated organic component.

4,898,756

INSERT FOR A SANDWICH STRUCTURE

Walter Oefner, Otterfing, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 4, 1988, Ser. No. 228,284
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1987, 3725974
Int. Cl.[4] F16B *19/04*
U.S. Cl. 428—34.1 21 Claims



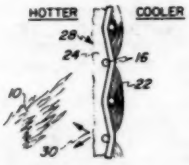
1. An insert for use in sandwich structures comprising a circular shank with a concentric bore, at least one circular head fixed eccentrically to the shank, the bore of the shank being continued through the head, the bore being eccentric to the head.

4,898,757

CONVERTIBLE TEXTILE FIRE BLOCK MATERIAL

Anton Maix, P.O. Box 21306, Ft. Lauderdale, Fla. 33335

Filed Jul. 22, 1985, Ser. No. 757,478
Int. Cl.[4] B32B *3/02*
U.S. Cl. 428—97 24 Claims



1. A single textile material fabric having at least a portion

thereof convertible by flux of heat into a fire barrier material, comprising:

a woven wool textile material means for forming a portion of said single fabric, said material means including a front face in a normal, first state, said material means also having a rear face, at least a portion of said front face being convertible by heat or flame into a fire retardant barrier with a fire retardant barrier face in a fired, second state to protect said rear face; and

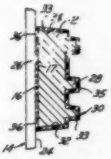
a carrier means connected to said material means forming an under construction for said single fabric, said carrier means for supporting said material means in said normal, first state for use as a textile fabric and for supporting said fire retardant barrier and said textile material means in said fired, second state for use as a fire retardant barrier, said carrier means connected to said material means in said normal, first state and said fired, second state, whereby said single fabric is usable alone as a fire retardant barrier for matter situated rearward of said rear face.

4,898,758

PAINT MASK

Ronald B. Lipson, 6085 Pickwood Dr., West Bloomfield, Mich. 48033

Filed Sep. 6, 1988, Ser. No. 240,607
Int. Cl.[4] B05C *11/16*
U.S. Cl. 428—99 **2 Claims**



1. A combination paint mask and insignia plate for protecting the exposed surfaces of a three-dimensional vehicle insignia plate mounted on and projecting outwardly from the surface of a vehicle body, the insignia plate having an outer perimeter and a flat under surface,

the mask including an integral molded thin hollow part of plastic material wherein the inner surface of said part is in obverse form to the insignia plate for abutting engagement there over, and wherein the outer surface of said part is a slightly enlarged replica of the outer surface of the insignia plate, and wherein the peripheral edge portion of said part defining the opening of the hollow part seals the insignia plate immediately adjacent the vehicle body and immediately adjacent said outer and inner perimeters;

and a plurality of spaced flexible coplanar anchor flanges upon said peripheral portion extending radially inward, underlying and retainingly engaging said under surface and peripheral portions of said insignia;

said flanges being spaced around said peripheral portion;

said insignia plate having a layer of adhesive material connected to and underlying said insignia plate for anchoring said insignia plate to said body, said adhesive material spacing peripheral portions of said insignia plate from said body,

said flanges being deflectable and of such shape and dimension as to be self-securing under and around said insignia plate in the space between said peripheral portions and said body formed by said adhesive material;

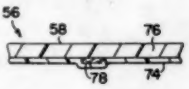
whereby the insignia plate is protected from paint sprayed on said body immediately adjacent said plastic part.

4,898,759

MOLDED PRINTED CIRCUIT BOARD FOR USE WITH A BRUSHLESS ELECTRIC MOTOR

John W. Hoover, Huntington, and Charles R. Marracino, Torrington, both of Conn., assignors to Nidec Corporation, Torrington, Conn.

Filed Jul. 27, 1988, Ser. No. 225,090
Int. Cl.[4] B32B *3/00*
U.S. Cl. 428—99 **11 Claims**



1. A molded one piece printed circuit board for use in a motor having a stator having a plurality of attachment means spaced thereabout and a rotor rotating about an axis, said printed circuit board comprising:

a first layer with openings therein for providing electrical insulation;

a plurality of conductors, selected ones of which register with corresponding ones of said openings; and

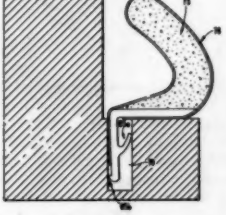
a second layer of molded plastic construction having an inner surface configured to receive said first layer and said conductors, said second layer having a plurality of openings registered with certain ones of said conductors and said first layer openings, and further having an opposed outer surface with a plurality of integrally formed projections therefrom spaced thereabout, said projections configured to be in registration with and adapted to be received by said stator attachment means, said second layer projections configured to affix the printed circuit board to said stator in a preferred alignment and preclude relative movement therebetween.

4,898,760

PROCESS AND APPARATUS FOR EXTRUDING A LOW DENSITY ELASTOMERIC THERMOPLASTIC FOAM

Louis Halberstadt, Andover; Peter E. Mertinooke, Amesbury, both of Mass.; Joseph V. Perry, Chester, N.H., and Dan C. Muessel, Danvers, Mass., assignors to Amesbury Industries, Inc., Chester, N.H.

Filed Nov. 17, 1987, Ser. No. 121,805
Int. Cl.[4] E06B *7/16*
U.S. Cl. 428—122 **14 Claims**



1. A weatherseal comprising:

a soft, low density elastomeric thermoplastic foam profile having a density less than 20 lbs/ft^3 and foamed from a thermoplastic elastomer having a durometer reading of less than 65;

a means for attaching said weatherseal to a structure, said means for attaching being bonded along the length of said foam profile; and

a thin, low friction skin bonded to at least part of the surface of said foam profile.

4,898,761

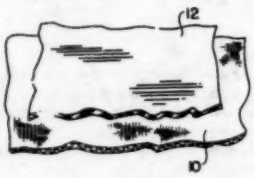
BARRIER FABRIC AND METHOD

Jerry A. Dunaway, Old Hickory; Leon H. Zimmerman, Nashville, and Nancy T. LaTondress, Mt. Juliet, all of Tenn., assignors to Reemay, Inc., Old Hickory, Tenn.

Continuation-in-part of Ser. No. 96,048, Sep. 11, 1987, abandoned. This application Dec. 7, 1988, Ser. No. 281,104

Int. Cl.[4] B32B 7/00

U.S. Cl. 428—137 12 Claims



1. Method of producing a barrier fabric which is permeable to liquid vapors and impermeable to liquids, said method comprising the steps of first laminating a vapor impermeable polymer film to a reinforcing porous fibrous web to provide a composite web and then needling the film of the composite web with tapered needles to provide a plurality of micropores through said film, said micropores being sufficiently small to prevent substantial transmission of liquids and sufficiently large to permit transmission of vapors.

4,898,762

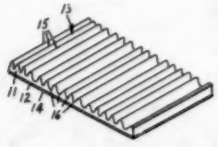
EASY TEAR STERILIZATION INDICATOR TAPE

Josephine S. Brown, and Alan J. Sipinen, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 1, 1988, Ser. No. 212,661

Int. Cl.[4] D06N 7/04

U.S. Cl. 428—152 26 Claims



1. An elongate strip of normally tacky and pressure-sensitive adhesive tape wound convolutely upon itself about a core to form a roll, said tape having particular utility for use as a finger-tearable sterilization indicator tape, comprising in combination a predominantly crystalline isotactic polypropylene film backing having an overall thickness on the order of 75–115 micrometers with one smooth side and one rough side, a layer of normally tacky and pressure-sensitive adhesive, and an indicator means for determination that said tape has been exposed to a sterilization procedure, said rough side having closely spaced randomly disposed valleys extended substantially at right angles to the lateral edges of said tape, said valleys separated by ridges and having a depth greater than one-half the overall thickness, so that the tape has the general appearance of creped paper sterilization indicator tape but differs in that it is consistently readily finger-tearable in a straight line at right angles to its lateral edges, said tape, when subjected to a stretching force parallel to its length, differing from sterilization indicator tape having a smooth-surfaced polypropylene film backing in that it elongates throughout its length without reducing significantly in width.

4,898,763

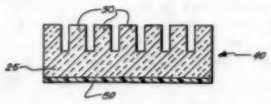
CURED POLYIMIDE FOAM STRUCTURES AND THEIR PRODUCTION

Gregory A. Ferro, Hoffman Estates, Ill., assignor to Imi-Tech Corporation, Elk Grove Village, Ill.

Continuation of Ser. No. 261,114, Oct. 24, 1988, abandoned. This application May 26, 1989, Ser. No. 357,549

Int. Cl.[4] B32B 3/26, 27/34

U.S. Cl. 428—159 39 Claims



28. An integral body of cured polyimide foam having a plurality of spaced-apart laterally-proximate individual portions integral with and extending from a continuous portion thereof.

4,898,764

MOLDING OF FOAM RESIN HAVING A HOLLOW MEMBER

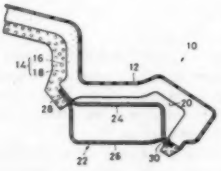
Junichi Kurihara, and Masanori Hara, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 11, 1989, Ser. No. 378,675

Claims priority, application Japan, Jul. 12, 1988, 63-91483[U]

Int. Cl.[4] B32B 3/26

U.S. Cl. 428—188 6 Claims



1. A molding of foam resin, comprising;
a substrate constituted by a plurality of resin layers at least one of which is formed of foam resin; and
a hollow member having outwardly extending flanges;
said flanges of said hollow member being buried in said layer of foam resin.

4,898,765

IMPREGNATION-PRINTED MOLDED ARTICLE

Tsunenobu Sato, Kokubunji, and Kiitiro Fukui, Fuji, both of Japan, assignors to Polyplastics Co., Ltd., Osaka, Japan

Filed Oct. 8, 1987, Ser. No. 106,734

Claims priority, application Japan, Oct. 15, 1986, 61-245005

Int. Cl.[4] B32B 3/00; C08F 8/00; C08L 67/02

U.S. Cl. 428—195 3 Claims

1. A molded article comprising at least one surface which bears an impregnation-printed character and/or symbol consisting essentially of a sublimative dye which is impregnated within and fixed to said at least one surface, wherein said at least one surface consists essentially of a blend of resin components (A) and (B), wherein resin component (A) is a thermoplastic polyester in an amount between 80–40 weight percent,

and resin component (B) is at least one thermoplastic resin in an amount between 20–60 weight percent selected from the group consisting of acrylonitrile-butadiene-styrene, acrylonitrile-styrene, methylmethacrylate-butadiene-styrene,ethylene-ethylacrylate, acrylonitrile-EPDM-styrene, acrylonitrile-styrene-special acrylic rubber, polymethyl methacrylate, butadiene rubber and acrylonitrile rubber.

4,898,766

POLYMER FILM WITH CONDUCTIVE PATTERN AND METHOD OF MANUFACTURING THE SAME

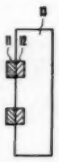
Toshiaki Tamamura; Katsuta; Osamu Niwa, Mito; Makoto Hikita, Mito, and Akio Sugita, Mito, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Continuation of Ser. No. 875,148, Jun. 17, 1986, abandoned, which is a division of Ser. No. 736,491, May 21, 1985, Pat. No. 4,608,129. This application Sep. 8, 1988, Ser. No. 243,242

Claims priority, application Japan, May 22, 1984, 59-101676; Jun. 4, 1984, 59-113095; Jul. 27, 1984, 59-155605; Dec. 7, 1984, 59-257395

Int. Cl.[4] B32B *3/00*

U.S. Cl. 428—195 6 Claims



1. A polymer film with a conductive pattern comprising an electrically insulative polymer film with an electrically conductive pattern containing an electrically conductive polymer of an aromatic compound or a heterocyclic compound selected from the group consisting of thiophene, pyrrole, furan, selenophene, tellurophene, carbazole and their derivatives, the conductive pattern being formed on at least one major surface of said insulative film and including an internal portion extending inwardly into said film from said at least one major surface.

4,898,767

COPPER-EXUDING BOROALUMINOSILICATE GLASSES

Gerald D. Fong, Beaver Dams, and Sheryl L. Hultman, Corning, both of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Division of Ser. No. 105,262, Oct. 7, 1987. This application Jun. 28, 1988, Ser. No. 212,478

Int. Cl.[4] H05K *1/03*

U.S. Cl. 428—210 4 Claims

1. An electronic device comprising a silicon element and a substrate for the element formed from a low dielectric, copper-exuding, boroaluminosilicate glass consisting essentially of, in percent by weight on the oxide basis, 56–64% SiO_2, 18–25% B_2O_3, 3–11% Al_2O_3, 0–2% CaO, 0–2% Li_2O, 0–1% K_2O, the total Li_2O+K_2O+CaO being 1.5–3%, and 1–20% CuO, and having a coefficient of thermal expansion of $30-35\times10^{-7}$ at 300° C., a dielectric constant not over 5.0 at 100 KHz, and a loss tangent not over 0.003 at 100 KHz.

4,898,768

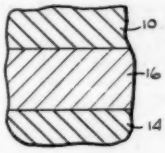
LAYERED STRUCTURE FOR ADHERING GOLD TO A SUBSTRATE AND METHOD OF FORMING SUCH

Harbhajan S. Randhawa, Boulder, Colo., assignor to Vac-Tec Systems, Inc., Boulder, Colo.

Filed Feb. 17, 1989, Ser. No. 312,622

Int. Cl.[4] B32B *7/02, 15/04*

U.S. Cl. 428—216 10 Claims



1. A layered structure for adhering gold or an alloy thereof to a substrate, said layered structure comprising:

a first layer overlying a substrate, said first layer including a member selected from the group consisting of metal nitrites, metal carbides and metal carbonitrides wherein said metal is selected from the group consisting of titanium, zirconium and hafnium; and

a transparent layer of refractory metal overlying said first layer and underlying gold or an alloy thereof, said transparent layer having a thickness greater than about 25 angstroms and less than about 100 angstroms.

4. A layered structure as claimed in claim 1 wherein said first layer has a thickness greater than about 0.1 microns and less than about 5 microns.

4,898,769

FIBRE REINFORCED COMPOSITE MATERIAL

Philip Laflin, Manchester, and Ian Molyneux, Warrington, both of United Kingdom, assignors to Tenmat Ltd., Manchester, England

Filed May 12, 1989, Ser. No. 350,797

Claims priority, application United Kingdom, Jun. 1, 1988, 8812923

Int. Cl.[4] B32B *5/16*

U.S. Cl. 428—283 8 Claims

1. Composite material comprising a water-soluble aluminous cement matrix to which are bonded superimposed layers of glass fibre fabric enclosed within it as reinforcement, wherein said fabric is a mechanically bonded chopped strand glass mat of mass/unit area not greater than 850 g/m^2.

4,898,770

PROCESS FOR PRODUCING PREFORMABLE CONTINUOUS STRAND MATS USING A MIXTURE OF THERMOSETTING AND THERMOPLASTIC RESIN

Sidney G. Dunbar, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Apr. 7, 1987, Ser. No. 35,523

Int. Cl.[4] B32B *5/02*

U.S. Cl. 428—283 4 Claims

1. A process for forming a continuous strand preformable mat having strand intersections and glass inclusions which consists of combining a thermosetting polyester binder material and a thermoplastic polyester binder material to form a binder matrix material; wherein the matrix material is present in a ratio of approximately 90% to 50%, by weight of the matrix material, thermoplastic polyester binder material to approximately 10% to 50%, by weight of the matrix material, thermosetting polyester binder material;

applying the binder matrix material to a continuous strand mat;

heating the continuous strand mat to a temperature in excess of 200° F. by placing the mat in a mold and then closing

the mold to form and solidify the mat such that the thermosetting binder material cures and hardens while the thermoplastic binder material softens and flows around strand intersections of the continuous strand mat;

thereafter cooling the continuous strand mat in order to solidify the thermoplastic polyester material of the binder matrix material to form a cooled mat; and,

passing the cooled mat through a set of compaction rollers set at a gap wide enough so as not to compact the mat but narrow enough to crush any glass inclusions present in the continuous strand mat.

4. The continuous strand mat formed according to the process of claim 1, wherein the thermoplastic polyester binder material is present in a ratio of approximately 80 wt. % to approximately 20 wt. % of the thermosetting polyester binder material.

4,898,771

AGENT FOR IMPARTING ANTISTATIC CHARACTERISTICS TO A THERMOPLASTIC POLYMER AND A THERMOPLASTIC POLYMER COMPOSITION CONTAINING THE AGENT

Marvin R. Havens, Greer, S.C., assignor to W. R. Grace & Co.-Conn., Duncan, S.C.

Division of Ser. No. 918,754, Oct. 14, 1986, Pat. No. 4,800,115. This application Sep. 21, 1988, Ser. No. 247,215

Int. Cl.[4] B05D *3/02*

U.S. Cl. 428—316 **7 Claims**

1. A method for protecting packaged static sensitive devices from electrostatic charges comprising:

(a) providing a package comprising an antistatic film having one or more layers, wherein at least one layer comprises a composition of a thermoplastic polymer in admixture with an antistatic agent wherein the polymer is polyethylene and the antistatic agent is a mixture of both fatty acid ester of polyhydroxy alcohol and polyalkoxylated compound, and wherein said film will, after 12 days at 160° F. (71° C.), still exhibit antistatic characteristics of a static decay time less than about 2000 milliseconds at low humidity less than about 15% relative humidity; and

(b) conforming said film about a selected device.

4,898,772

ABHESIVE COATING PREPARATION AND METHOD OF ABHESIVELY COATING UTENSILS

Manfred Priesch, Recklinghausen; Harald Rau, and Christian Weitemeyer, both of Essen, all of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Aug. 4, 1988, Ser. No. 228,246

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1987, 3728414

Int. Cl.[4] B32B *9/04, 15/08*

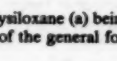
U.S. Cl. 428—332 **12 Claims**

1. A utensil, such as a baking tin, baking mold, frying pan, metal pot and the like having a surface which is adapted to be subjected to high heat, wherein said surface has an abhesive surface coating baked onto said surface, said coating comprising in heat-cured

(a) a heat curable polysiloxane, modified with polyol, and

(b) 0.05 to 4% by weight, calculated on the polysiloxane (a), of a linear siloxane which is reactive with the polysiloxane (a),

said modified polysiloxane (a) being the reaction product of a polysiloxane of the general formula



wherein

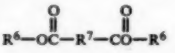
OR^1 is alkoxy derived from a primary or secondary alcohol with 1 to 4 carbon atoms,

R^2 is selected from the group consisting of alkyl and phenyl,

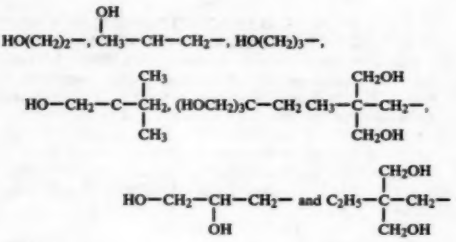
a=1 to 1.5, and

b=0.1 to 0.8, and

an ester group-containing polyol of the general formula

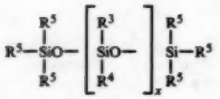


wherein R^6 is selected from the group consisting of



R^7 is alkylene, cycloalkylene or phenylene, and the polyol containing the ester groups has at least three hydroxyl groups,

the reaction being carried out in such a molar ratio, that one $SiOR^1$ group corresponds approximately to one COH group and the reaction being term-inated after a 25 to 90% conversion; said reactive linear polysiloxane (b) corresponding to the general formula



wherein

R^3, R^4 are the same or different and represent methyl or phenyl, with the proviso that at least 80 mole percent of R^3 and R^4 are methyl,

R^5 is selected from the group consisting of alkyl with 1 to 4 carbon atoms, phenyl and groups capable of reacting with the $SiOR^1$ or COH groups of the modified polysiloxane (a) with the proviso that at least one R^5 group is such a reactive group, and

$x \geq 0$.

2. The utensil of claim 1, wherein said coating has a thickness of about between 10 to 40 mm.

4,898,773

PHOTOGRAPHIC PAPER SUPPORT WITH A WATER RESISTANT COATING OF POLYETHYLENE

Ralf-Burkhard Dethlefs, Bissendorf; Bernd Scholz, Osnabrück, and Wolfram Wysk, Belm, all of Fed. Rep. of Germany, assignors to Felix Schoeller jr GmbH & Co. KG, Osnabrück, Fed. Rep. of Germany

Filed Jul. 24, 1987, Ser. No. 77,491

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1986, 3627859

Int. Cl.[4] B32B *27/08, 27/32*; G03C *1/76*

U.S. Cl. 428—332 **17 Claims**

1. A coated paper support material for photographic layers comprising

a photographic paper base having two sides;

a water resistant coating of a polyolefin disposed on each of

the two sides of the photographic paper base, where one of the two water resistant coatings includes a high pressure polyethylene having a density of from about 0.930 to 0.936 gram per cubic centimeter and containing from about 5 to 12 methyl groups for each 1000 carbon atoms.

4,898,774

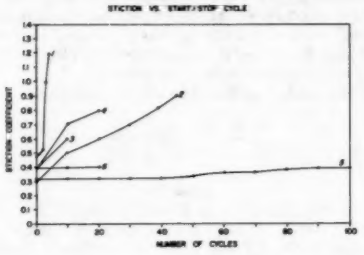
CORROSION AND WEAR RESISTANT MAGNETIC DISK

Tsutomu T. Yamashita; Ching-Cheng Shir, both of San Jose; Tu Chen, Saratoga, and Gu-Lane Chen, Fremont, all of Calif., assignors to Komag, Inc., Milpitas, Calif.

Continuation-in-part of Ser. No. 847,990, Apr. 3, 1986. This application Dec. 17, 1986, Ser. No. 943,333

Int. Cl.[4] G11B *5/64*

U.S. Cl. 428—336 27 Claims



1. Structure comprising:

a film of magnetic recording media on a substrate; and

a second layer formed above said film, said second layer comprising sputtered ZrO_2, a stabilizer and Al_2O_3, said structure being constructed for the recording of data in said film of magnetic recording media by magnetic induction recording, said second layer being the uppermost vacuum-deposited layer on said structure.

4,898,775

PAINT COATED METAL SHEETS

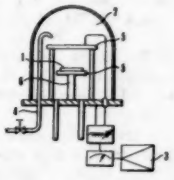
Joji Oka, and Ryoji Nishioka, both of Kanagawa, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 141,955, Jan. 11, 1988, abandoned, which is a continuation-in-part of Ser. No. 120,776, Nov. 16, 1987, abandoned, which is a continuation of Ser. No. 856,160, Apr. 25, 1986, abandoned. This application May 8, 1989, Ser. No. 349,934

Claims priority, application Japan, Apr. 27, 1985, 60-89933; Australia, Apr. 22, 1986, 56486/86; Canada, Apr. 25, 1986, 507657

Int. Cl.[4] B32B *15/08, 27/06*

U.S. Cl. 428—336 3 Claims



1. A paint coated metal sheet comprising a metal substrate and a paint film applied thereon, the uppermost surface part of said paint film containing fluorine atoms introduced thereinto as perfluoroalkyl groups including methyl fluoride and ethyl fluoride said perfluoroalkyl groups being introduced into said surface up to a depth of 1–5000 Å by a plasma treatment, with the remaining part of said paint film being non-fluorinated by said plasma treatment.

4,898,776

ISOCYANATE/SURFACTANT-MODIFIED POLYOL BINDER FOR MANUFACTURE OF LIGNOCELLULOSIC COMPOSITES

Michael G. Israel, Clearwater; George A. Grozdits, St. Petersburg, and Kenneth G. Trout, Tampa, all of Fla., assignors to Jim Walter Research Corp., St. Petersburg, Fla.

Continuation-in-part of Ser. No. 912,889, Sep. 29, 1986, abandoned. This application Nov. 21, 1988, Ser. No. 273,681

Int. Cl.[4] B32B *27/00*

U.S. Cl. 428—336 10 Claims

1. A synthetic board comprising lignocellulosic material bonded together with a binder comprising an organic polyisocyanate having at least two active isocyanate groups per molecule and a polyester polyol, the binder including a surfactant which adjusts the surface tension of the binder to a value about equal to or lower than the critical surface tension of the lignocellulosic material and helps to compatibilize the binder components, the amount of the surfactant being from about 0.01 to 5 percent by weight, based on the weight of the polyester polyol, with the proviso that the polyol does not contain any fatty acid material.

4. The synthetic board of claim 1 wherein the lignocellulosic material is bonded together to form a member selected from the group consisting of a particleboard, a waferboard, an oriented waferboard and an oriented strand board.

4,898,777

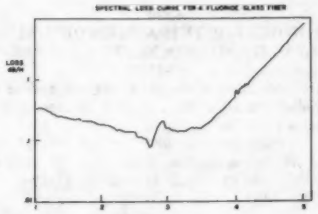
HIGH-STRENGTH FLUORIDE GLASS FIBERS AND PROCESS OF MAKING

Edwin A. Kindler, Takoma Park, and Danh C. Tran, Bethesda, both of Md., assignors to Infrared Fiber Systems, Silver Spring, Md.

Filed Jan. 24, 1989, Ser. No. 300,852

Int. Cl.[4] C03C *15/00*

U.S. Cl. 428—364 12 Claims



9. A method of producing a fluoride glass fiber having increased stength, comprising the steps of:

immersing a fluoride glass preform in a solution of H_3BO_3 dissolved in hydrochloric or nitric acid until a desired degree of surface etching is obtained;

removing said preform from said solution;

rinsing said preform with water or hydrochloric or nitric acid;

drying said preform with a volatile solvent; and then

drawing said etched preform into a fiber.

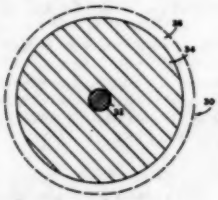
11. A fluoride glass fiber produced according to claim 9.

4,898,778

SILICON CARBIDE MONOFILAMENTS FOR IMPROVED COMPOSITE PROPERTIES AND METHOD

Raymond C. Loszewski, Windham, N.H., assignor to AVCO Corporation, Providence, R.I.

Filed Nov. 28, 1988, Ser. No. 276,797
Int. Cl.[4] B32B 9/00; D02G 3/00
U.S. Cl. 428—368 11 Claims



1. A high strength silicon carbide monofilament comprising:
a core; and
a stoichiometric bulk layer of silicon carbide deposited on the core, said bulk layer being further defined by a fine grain structure where the grain size continuously varies across the cross section and where the average grain size increases from the interface of the core and the bulk layer through a single peak of maximum average grain size intermediate the interface and the exterior surface of the bulk layer and then decreases to a second average grain size at the exterior surface of the bulk layer, the maximum grain size being less than 200 nanometers and the over all average grain size is between 90 and 100 nanometers.

4,898,779

POWDERS OF TETRAFLUOROETHYLENE COPOLYMER AND PROCESS POR PREPARING THE SAME

Tatsushiro Yoshimura; Nobuyuki Tomihashi, both of Takatsuki, and Shuhei Simazaki, Itami, all of Japan, assignors to Daikin Industries Ltd., Osaka, Japan

Filed Dec. 21, 1987, Ser. No. 135,217
Claims priority, application Japan, Dec. 22, 1986, 61-307131
Int. Cl.[4] B32B 5/16; C08L 27/12
U.S. Cl. 428—402 1 Claim

1. Powders of tetrafluoroethylene copolymer consisting essentially of particles of a copolymer selected from the group consisting of a tetrafluoroethylene/hexafluoropropylene copolymer and a tetrafluoroethylene/fluoro (vinyl ether) copolymer, said particles having a non-spherical shape which is characterized by a sectional profile which comprises at least one linear section, wherein the frictional packing ratio is in the range of 20 to 100%, the average particle size (μ) is in the range of 100 to 500 μm, and the average particle size (μ) and the bulk density (ρ_1) of the powders satisfy the following equation:

$$\log \mu < 2.45\ \rho_1 + 0.75.$$

4,898,780

PRODUCTION OF MICROCAPSULES

Michael E. A. Seitz, Dayton, Ohio, assignor to The Standard Register Company, Dayton, Ohio

Continuation-in-part of Ser. No. 866,224, Mar. 22, 1986, Pat. No. 4,729,792, which is a continuation-in-part of Ser. No. 796,196, Nov. 2, 1985, abandoned. This application Jan. 7, 1988, Ser. No. 141,633
The portion of the term of this patent subsequent to Mar. 8, 2005, has been disclaimed.
Int. Cl.[4] B01J 13/02
U.S. Cl. 428—402.21 10 Claims

1. A process for the production of microcapsules containing an oily solution, comprising:
dispersing an oily solution including a crosslinking agent into an aqueous solution;
forming a polysalt in said aqueous solution, said polysalt including a high molecular weight polyanion and a polycationic polyamine having a molecular weight of less than 1200 and having a functionality of at least three, whereby a hard, thick layer is formed around droplets of oily solution and microcapsules are produced.

10. The product produced by the process of claim 1.

4,898,781

WATER-SOLUBLE MICROCAPSULES

Takashi Onouchi, Tokyo; Hironori Sugai, Yokohama; Kazuo Sekiguchi, Nagareyama; Yoshikazu Hoseda, Fujisawa, and Eiichi Yoshida, Tokyo, all of Japan, assignors to Showa Denko K.K., Tokyo, Japan

Filed Nov. 9, 1987, Ser. No. 118,004
Claims priority, application Japan, Nov. 7, 1986, 61-263842
Int. Cl.[4] A61K 37/48; B01J 13/02; C12N 11/08
U.S. Cl. 428—402.22 3 Claims

1. Water-soluble microcapsules comprising:
a core material of hydrophilic substance which comprises an enzyme and a water-containing polyhydroxy compound in an amount of 2 to 50 times that of said enzyme by weight and having a water content of 5 to 40% by weight, said enzyme being dissolved or dispersed in said water-containing polyhydroxy compound; and
a coating material of polyvinyl alcohol having an average degree of polymerization in the range of 200 to 3,000 and a saponification ratio of not less than 90%.

4,898,782

LATEX COATING COMPOSITION OF MULTILAYERED COPOLYMER PARTICLES OF VINYLIDENE CHLORIDE AND ACRYLIC COMONOMERS

Taeik Min, Pittsford, and Robert E. Touhsaent, Fairport, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 27, 1989, Ser. No. 343,660
Int. Cl.[4] C08L 27/08
U.S. Cl. 428—407 8 Claims

1. A thermoplastic film coated with a dried latex composition containing a multi-layered particle for suspending in an aqueous solution, said multi-layered particle including:
(a) an acrylic seed layer;
(b) an intermediate layer of a vinylidene chloride monomer, an acrylic ester monomer, and an acrylic acid monomer, forming a terpolymer having a high vinylidene chloride concentration; and,
(c) an outer skin layer of a vinylidene chloride monomer, acrylic ester monomer, and an acrylic acid monomer, forming a terpolymer having a low vinylidene chloride concentration.

4,898,783

SOUND AND THERMAL INSULATION

Francis P. McCullough, Jr., Lake Jackson; Robert L. Hotchkiss, Midland; R. Vernon Snelgrove, Freeport, all of Tex.; David M. Hall, Auburn, Ala., and Jacqueline R. McCullough, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 918,738, Oct. 14, 1986, abandoned. This application Oct. 13, 1987, Ser. No. 108,255

The portion of the term of this patent subsequent to Jun. 6, 2006, has been disclaimed.

Int. Cl.[4] B32B *9/00, 5/02;* B64C *1/40*

U.S. Cl. 428—408 26 Claims

1. A thermal insulating and/or sound absorbing structure comprising a batting of resilient elongatable, non-linear, nonflammable, carbonaceous fibers, said fibers having a reversible deflection ratio of greater than 1.2:1, an aspect ratio greater than 10:1 and a limited oxygen index value greater than 40.

4,898,784

TIE LAYER COMPOSITION AND LAMINATED STRUCTURES CONTAINING SAME

Andrea Sanders, Katy, and Glenn R. Himes, Houston, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 30, 1987, Ser. No. 139,549

Int. Cl.[4] B32B *27/36, 27/08;* C08L *53/02*

U.S. Cl. 428—412 11 Claims

1. A laminated structure comprising a plurality of polymeric layers, at least one of said layers containing a polar group which is reactive with a carboxyl radical, said at least one layer being selected from the group consisting of copolymers of one or more olefins and one or more other monomers selected from the group consisting of unsaturated esters, unsaturated acids, unsaturated alcohols and unsaturated ionomers, at least one olefin polymer layer and at least one other polymeric layer being a tie layer between said at least one layer containing a polar group and said at least one olefin polymer layer comprising at least one carboxylated, selectively hydrogenated block copolymer, said carboxylated, selectively hydrogenated block copolymer comprising at least one polymeric block containing predominantly monoalkenyl aromatic hydrocarbon monomer units and at least one polymeric block containing predominantly hydrogenated conjugated diolefin monomer units, and at least one uncarboxylated, selectively hydrogenated block copolymer, comprising at least one polymeric block containing predominantly monoalkenyl aromatic hydrocarbon monomer units and at least one polymeric block containing predominantly hydrogenated conjugated diolefin monomer units, and at least one uncarboxylated, selectively hydrogenated block copolymer, comprising at least one polymeric block containing predominantly conjugated diolefin monomer units and at least one polymeric block containing hydrogenated conjugated diolefin monomer units, wherein said tie layer comprises, on average, from about 0.01 to about 10 carboxyl radicals per polymer chain contained in said tie layer, said laminated structure having been prepared by bringing the separate layers together while said separate layers are in the molten phase and while said separate layers are in motion.

4,898,785

CR_2O_3-PROTECTIVE COATING AND PROCESS FOR ITS MANUFACTURE

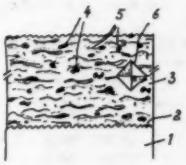
Heiko Gruner, Beinwil am See, Switzerland, assignor to Plasmainvent AG, Zug, Switzerland

Continuation of Ser. No. 942,843, Jan. 15, 1987, abandoned. This application May 22, 1989, Ser. No. 356,615

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1985, 3513892

Int. Cl.[4] B05D *1/08*

U.S. Cl. 428—472 8 Claims



1. An article comprising, in combination, a protective layer of Cr_2O_3 on a metal support applied by a vacuum plasma spray process, said support having a surface pre-treated by a transferred electric arc immediately prior to the application of said protective layer and wherein the Cr_2O_3 is conveyed in said spray process in a plasma flame having a reducing atmosphere, said protective layer having a density almost corresponding to the density of chromium oxide as a solid material, a residual porosity of less than 2%, a Vickers hardness of more than 2000 kp/mm^2 (HV), and being substantially free of imbedded metallic phases.

4,898,786

POLYESTER FILM PRIMED WITH AN AMINOFUNCTIONAL SILANE, AND FILM LAMINATES THEREOF

Howard W. Swofford, Taylors, S.C., assignor to Hoechst Celanese Coproration, Somerville, N.J.

Filed Jun. 15, 1988, Ser. No. 207,069

Int. Cl.[4] B32B *27/06, 27/36, 9/04, 13/12*

U.S. Cl. 428—480 14 Claims

1. An oriented self-supporting high modulus polyester film having a continuous primer coating composition on one or both sides thereof, said coating composition comprising the dried residue of a hydrolyzed aminosilane compound having the formula in the unhydrolyzed state:

$$XSi(R^2)_a(R^3)_b$$

wherein X is a radical selected from the group consisting of $H_2NR^1HNR^1$—and $H_2NR^1HNR^1HNR^1$—; the R^1's are the same of different groups selected from the group consisting of C_1 to C_8 alkyl or phenyl; R^2 is a hydrolyzeable group selected from the group consisting of C_1 to C_8 alkoxy, an acetoxy group or a halide; R^3 is a nonreactive, nonhydrolyzeable group selected from the group consisting of C_1 to C_3 alkyl or phenyl; (a) is an integer ranging from 1 to 3; (b) is an integer ranging from 0 to 2, with the sum of (a) and (b) being 3, said primer coating composition being present at a weight effective to improve the adhesion of other polymers to said film.

4,898,787

EMULSION POLYMERIZED COHESIVE POLYMER LATEX USEFUL AS COLD SEAL COATING AND IMPROVED SEALABLE ARTICLES TREATED WITH THE SAME

Taeik Min, Pittsford, and Robert E. Touhsaent, Fairport, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 69,049, Jul. 2, 1987, abandoned. This application Apr. 28, 1988, Ser. No. 187,303

Int. Cl.[4] B32B *27/06*

U.S. Cl. 428—480 16 Claims

1. A coated or impregnated substrate which includes a cold sealable, emulsion polymerized cohesive terpolymer composition for coating or impregnating said substrate, said terpolymer consisting of:

(a) from about 40 to about 75 percent by weight of a first monomer comprising ethyl acrylate;

(b) from about 15 to about 50 percent by weight of a second monomer comprising vinyl acetate; and,

(c) from about 0.1 to about 10 percent by weight of a third monomer comprising methacrylic acid,

whereby said terpolymer coated or impregnated substrate having low tack characteristics, high crimp strength and is cohesive only to substrates which are coated or impregnated with said terpolymer when cold sealed under pressure.

4,898,788

DECORATIVE LAMINATED SHEET AND DECORATIVE OVERLAID PLYWOOD FACED WITH THERMOSETTING RESIN

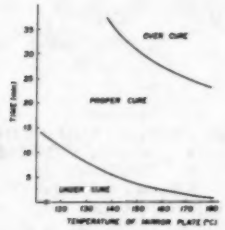
Kenji Minami, Suita; Hidetaka Yatagai, Nishinomiya, and Yoshinori Sano, Kobe, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Filed Jul. 19, 1988, Ser. No. 221,208

Claims priority, application Japan, Jul. 21, 1987, 62-179953

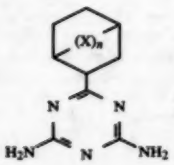
Int. Cl.[4] B32B *27/10, 27/36*

U.S. Cl. 428—481 22 Claims



1. A thermosetting resin decorative laminated sheet faced with a resin-impregnated sheet layer obtained by impregnating a sheetlike material with a resin composition containing an amino resin (I) produced by the reaction of formaldehyde with an amino compound (A) containing as an essential component thereof at least one carboguanamine (a) represented by the formula I:

(I)



wherein X is CH_2 and n is 0 or 1, and curing the impregnated sheetlike material, said amino resin (I) having a degree of methanol miscibility, M_1, in the range of 1 to 200, and a degree of methanol miscibility, M_2, in the range of 90 to 200.

4,898,789

LOW EMISSIVITY FILM FOR AUTOMOTIVE HEAT LOAD REDUCTION

James J. Finley, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 4, 1988, Ser. No. 176,979

The portion of the term of this patent subsequent to Feb. 6, 2007, has been disclaimed.

Int. Cl.[4] B21D *39/00*

U.S. Cl. 428—623 11 Claims

1. A high transmittance, low emissivity article comprising:

a. a transparent nonmetallic substrate;

b. a first transparent antireflective metal oxide film deposited on a surface of said substrate;

c. a first transparent infrared reflective metallic film deposited on said antireflective metal oxide film;

d. a transparent metal-containing primer film deposited on said infrared reflective metallic film;

e. a second transparent antireflective metal oxide film deposited on said primer film;

f. a second transparent infrared reflective metallic film deposited on said second transparent antireflective metal oxide film;

g. a second transparent metal-containing primer film deposited on said second infrared reflective metallic film; and

h. a third transparent antireflective metal oxide film deposited on said second primer film.

4,898,790

LOW EMISSIVITY FILM FOR HIGH TEMPERATURE PROCESSING

James J. Finley, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 947,799, Dec. 29, 1986, Pat. No. 4,806,220. This application Apr. 1, 1988, Ser. No. 176,511

The portion of the term of this patent subsequent to Feb. 6, 2007, has been disclaimed.

Int. Cl.[4] B21D *39/00*

U.S. Cl. 428—623 12 Claims

1. A high transmittance, low emissivity article comprising:

a. a transparent nonmetallic substrate;

b. a first transparent antireflective metal oxide film deposited on a surface of said substrate;

c. a transparent infrared reflective metallic film;

d. a transparent metal-containing primer film deposited on said infrared reflective metallic film comprising a first layer of metal and a second layer of metal oxide; and

e. a second transparent antireflective metal oxide film deposited on said primer film wherein said primer film comprises a different metal oxide from said second antireflective metal oxide film.

4,898,791

SOLDERABLE LAYER SYSTEM

Dieter Schurig, Wallrabenstein, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 5, 1988, Ser. No. 152,620

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1987, 3705258

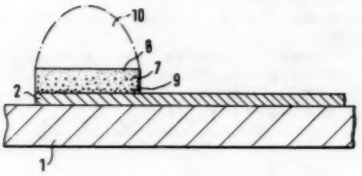
Int. Cl.[4] B32B *15/04*

U.S. Cl. 428—629 6 Claims

1. In a solderable layer system in which a conductor layer, which is partially covered by a layer of solder, is applied to a support, the improvement wherein:

said conductive layer is disposed between and contiguous said support and layer of solder, said conductive layer being formed of a material which includes an oxide of tin; said system includes a reducing agent; and

the solder layer comprises an alloy, brass, which includes said reducing agent, said reducing agent being operative



with said oxide to free the tin for improved adherence between the solder layer and the conductive layer.

4,898,792

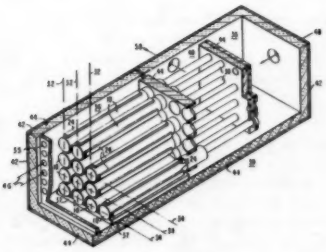
ELECTROCHEMICAL GENERATOR APPARATUS CONTAINING MODIFIED HIGH TEMPERATURE INSULATION AND COATED SURFACES FOR USE WITH HYDROCARBON FUELS

Prabhakar Singh, Export; Roswell J. Ruka, Churchill, and Raymond A. George, Forest Hills, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 7, 1988, Ser. No. 280,915

Int. Cl.[4] H01M *8/06*

U.S. Cl. 429—19 **23 Claims**



1. An electrochemical generator apparatus, containing an electrochemical cell assembly comprising a plurality of electrochemical cells and insulation materials in the form of at least one of porous partition boards between cell bundles, porous generator insulation, porous cell support boards, porous fuel entry distribution boards, and porous fuel conditioner boards, where a gaseous fuel containing hydrocarbons will contact the insulation materials, the improvement characterized in that at least one of the insulation materials is impregnated with metal atom containing material, where the metal is selected from the group consisting of (A) metals selected from the group consisting of Mg, Ca-Al, Sr-Al, Ce, Ba, and mixtures thereof, and, (A) metals plus Ni.

4,898,793

FUEL CELL DEVICE

Mitsuie Matsumura; Toshihide Tanaka; Hiroaki Urushibata, and Kazunao Sato, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Nov. 1, 1988, Ser. No. 265,815

Claims priority, application Japan, Nov. 4, 1987, 62-277496; Nov. 20, 1987, 62-291870

Int. Cl.[4] H01M *8/04, 8/14*

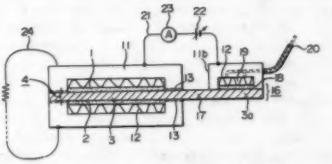
U.S. Cl. 429—38 **25 Claims**

1. A fuel cell device comprising:

a fuel cell including an oxidant gas side electrode and a fuel gas side electrode which are disposed away from each other, and an electrolyte layer sandwiched therebetween;

a half cell including an electrolyte layer, a single electrode and a gas chamber;

a connecting electrolyte layer for connecting, in an ion conductive manner, said electrolyte layer of said fuel cell and said electrolyte layer of said half cell; and



an electrochemical circuit which is formed by a single electrode of said half cell and either of said electrodes of said fuel cell, and which electrochemically transfers the electrolyte between said fuel cell and said half cell, whereby the quantity or the composition of the electrolyte contained in said fuel cell is performed by the transference of the electrolyte.

4,898,794

HYDROGEN ABSORBING NI,ZR-BASED ALLOY AND RECHARGEABLE ALKALINE BATTERY

Hidekazu Doi, Omiya, and Ritsue Yabuki, Iwatsuki, both of Japan, assignors to Mitsubishi Metal Corporation, Tokyo, Japan

Filed Jul. 17, 1989, Ser. No. 380,608

Claims priority, application Japan, Dec. 27, 1988, 63-330423; Dec. 27, 1988, 63-330424

Int. Cl.[4] H07M *4/36*; C22C *19/03, 30/00*

U.S. Cl. 429—59 **14 Claims**

8. A sealed Ni-hydrogen rechargeable battery comprising a negative electrode provided with a hydrogen absorbing alloy as an active material, an Ni positive electrode, a separator and an alkaline electrolytic solution, wherein the hydrogen absorbing alloy is composed of a hydrogen absorbing Ni,Zr-based alloy comprising 5 to 20% by weight of titanium (Ti), 10 to 37% by weight of zirconium (Zr), 5 to 30% by weight of manganese (Mn), 0.01 to 15% by weight of tungsten (W), 6 to 30% by weight of iron (Fe), and balance unavoidable impurities.

4,898,795

LID FOR LEAD-ACID ACCUMULATORS WITH ELASTIC AND DEFORMABLE POLE SEATS

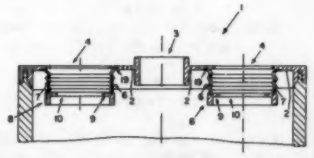
Olimpio Stocchiero, 5 Via Kennedy, 36050 Montorso Vicentino, Italy

Filed Oct. 4, 1988, Ser. No. 253,033

Claims priority, application Italy, Oct. 9, 1987, 85615 A/87

Int. Cl.[4] H01M *4/00*

U.S. Cl. 429—66 **6 Claims**



1. A lead-acid accumulator lid made of a plastic material and having a substantially planar body with an upper and lower

surface, said body having and edge portion suited to be permanently attached to an accumulator case;

a central opening for the filling and refilling of the electrolyte contained in the accumulator;

a pair of openings provided in the lid for the passage of electric poles which extend from the accumulator, said openings having substantially circular edges;

an expandable elastic, flexible, substantially tubular member extending from each of said edges into said lid for providing a sealing connection with said poles, said tubular member extending axially to said openings, wherein said expandable elastic flexible tubular members are formed integrally with said lid and are shaped to be compressible, co-axially to said openings, said tubular members projecting from said opening edges inwardly of the accumulator case, so that the upper surface of the lid is substantially planar and free of projections in correspondence with said openings, whereby the axial sliding of the poles relative to the lid is effected thereby insulating the lid from stress.

4,898,796

LEAD-ACID STORAGE BATTERY

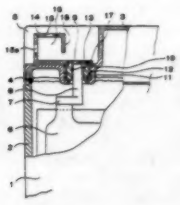
Hiroshi Furukawa; Sachio Uemichi; Toshihiro Isoi, and Kenzo Kawakita, all of Takatsuki, Japan, assignors to Yuasa Battery Co., Ltd., Takatsuki, Japan

Filed Nov. 8, 1988, Ser. No. 268,448

Claims priority, application Japan, Nov. 9, 1987, 62-282787

Int. Cl.[4] H01M *2/02*

U.S. Cl. 429—178 **3 Claims**



1. A lead-acid storage battery including a connecting terminal assembly which comprises;

a bushing made from lead or lead alloy, buried in a cover of said battery in the same process as when said cover is molded, and including a hole into which a pole is fitted; and

a connecting terminal made by press working a sheet of metal, except for lead or lead alloy, having good electrical conductivity, having at least one bolt-insertion hole and a space for accommodating a nut, fixed to the upper portion of said bushing, and having a strength resistive to a torque of 40 kg-cm or more caused by a bolt being inserted into said bolt-insertion hole.

4,898,797

MULTIPLE XEROPRINTED COPIES FROM A SINGLE EXPOSURE USING PHOTOSENSITIVE FILM BUFFER ELEMENT

William T. Gruenbaum; William Mey, both of Rochester, and Kelly S. Robinson, Fairport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 18, 1988, Ser. No. 220,867

Int. Cl.[4] G03G *13/24*

U.S. Cl. 430—51 **8 Claims**

1. In a process for making multiple copies from a single imagewise exposure of an electrostatographic element having an insulating layer between a conductive layer and a photoconductive layer, where said element is simultaneously charged and imagewise exposed, then exposed with uniform light to drive the charges down from the surface of the electrostatographic element to the surface of the insulating layer, the improvement wherein said uniform light is absorbed by said photoconductive layer and does not penetrate through said photoconductive layer to said insulating layer.

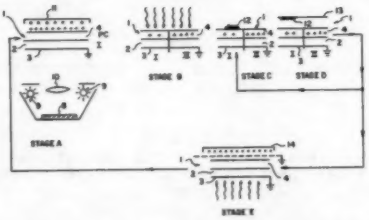
6. A method of making multiple electrostatographic copies comprising

(A) simultaneously charging and imagewise exposing an electrostatographic element which comprises, in order,

(1) a conductive layer;

(2) an insulating layer; and

(3) a photoconductive layer;



(B) uniformly exposing said element with uniform light applied directly to the surface of said photoconductive layer such that said uniform light is absorbed by said photoconductive layer and does not penetrate through said photoconductive layer to said insulating layer, thereby forming a latent electrostatic image on said insulating layer;

(C) developing said latent electrostatic image and transferring said developed image to a receiver; and

(D) repeating step (C) without additional imagewise exposures of said element.

4,898,798

PHOTOSENSITIVE MEMBER HAVING A LIGHT RECEIVING LAYER COMPRISING A CARBONIC FILM FOR USE IN ELECTROPHOTOGRAPHY

Masao Sugata, Yokohama; Tohru Den, Atsugi; Susumu Ito; Keiji Hirabayashi, both of Tokyo; Keiko Ikoma, Yokohama; Noriko Kurihara, Kawasaki; Kuniji Osabe, Tama; Tatsuo Takeuchi, Kawasaki; Hiroshi Satomura, Hatogaya; Yoshihiro Oguchi, Yokohama; Akio Maruyama, Tokyo, and Keishi Saito, Nabari, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 25, 1987, Ser. No. 101,948

Claims priority, application Japan, Sep. 26, 1986, 61-227302; Sep. 26, 1986, 61-227303; Sep. 26, 1986, 61-227304; Sep. 26, 1986, 61-227305; Sep. 26, 1986, 61-227306; Sep. 26, 1986, 61-227310; Sep. 26, 1986, 61-227311; Sep. 4, 1987, 62-220491

Int. Cl.[4] G03G *5/10*

U.S. Cl. 430—58 **19 Claims**

1. A photosensitive member for use in electrophotography comprising a substrate and a divided-functional light receiving layer having a charge carrier transportation layer and a change carrier generation layer in this order from the side of said substrate, wherein said charge carrier transportation layer has a thickness of 1 to 100 μm and comprises a film containing (i) carbon atoms in an amount of at least 65 atomic percent, (ii) hydrogen atoms in an amount 30 atomic percent or less and (iii) at least one element selected from the group consisting of boron, aluminum, gallium, indium, thallium, nitrogen, phosphorus, arsenic, antimony and bismuth in an amount of 5 atomic ppm to 5 atomic percent; the matrix of said film being said carbon atoms; said film having a value of 0.18 to 5.9 for the ratio of I_D/I_G between the peak intensity (I_D) of 1333 cm^{-1} and the peak intensity (I_G) of 1850 cm^{-1} in Raman spectra; and wherein said film contains a diamond phase in volume ratio of 50 to 90 percent, a graphite phase in a volume ratio of 20 percent or less and an amorphous carbon phase for the balance.

4,898,799

PHOTORECEPTOR

Yoshihide Fujimaki, Hachioji, and Shigeki Takenouchi, Chofu, both of Japan, assignors to Konica Corporation, Tokyo, Japan

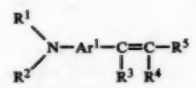
Filed Jul. 7, 1988, Ser. No. 216,052

Claims priority, application Japan, Jul. 10, 1987, 62-173640; Sep. 25, 1987, 62-241983

Int. Cl.[4] G03G 5/14, 5/06

U.S. Cl. 430—59 4 Claims

3. A photoreceptor for electrophotography comprising an electroconductive support and, provided thereon, a photosensitive layer containing a titanyl phthalocyanine compound which has major peaks in terms of Bragg's 2θ angle to the CuKα characteristic X-ray wavelength at 1.541 Å at least at 9.5±0.2 degrees, 11.7 ±0.2 degrees, 15.0±0.2 degrees, 23.5±0.2 degrees, 24.1±0.2 degrees and 27.3±0.2 degrees as a carrier generating substance, and a compound having formula I as a carrier transporting substance;



I

(wherein, R^1 and R^2 independently is an alkyl group or an aryl group either of which may have a substituent; R^3 and R^4 independently is a hydrogen atom, a halogen atom, or an alkyl group, an aryl group, an alkoxy group or an amino group, provided that each group may have a substituent; R^5 is an aryl group or a heterocyclic group, either of which groups may have a substituent; and Ar^1 represents a substituted or unsubstituted aryl group.

4,898,800

AMINOBIPHENYL CHARGE TRANSPORTING MATERIALS AND ELECTROPHOTOGRAPHIC PHOTOCONDUCTORS USING THE SAME

Tomoyuki Shimada, Numazu; Masaomi Sasaki, Susono; Mitsuru Hashimoto, and Tamotsu Aruga, both of Numazu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

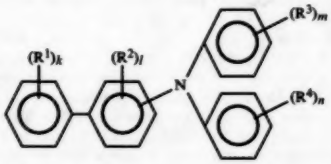
Filed Oct. 20, 1988, Ser. No. 260,063

Claims priority, application Japan, Oct. 20, 1987, 62-265662; Jan. 19, 1988, 63-010330; Feb. 19, 1988, 63-037234; Apr. 19, 1988, 63-097464

Int. Cl.[4] G03G 5/14

U.S. Cl. 430—59 17 Claims

1. An electrophotographic photoconductor, comprising an electroconductive support and a photoconductive layer formed thereon comprising at least one aminobiphenyl compound having the formula:



(I)

wherein R^1 represents hydrogen, an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms, a thioalkoxy group, an aryloxy group, a methylenedioxy group, an aralkyl group, a nitro group, or an unsubstituted or substituted aryl group; R^2 represents hydrogen, an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms, halogen; and R^3 and R^4 each represent hydrogen, an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms, halogen, a dialkylamino group, an amino group, a thioalkoxy group, an aryloxy group, a methylenedioxy group, an aralkyl group, or an unsubstituted or substituted aryl group, k, m and n each represent an integer of 0 to 5, and l represents an integer of 0 to 4, provided that R^1, R^2, R^3 and R^4 cannot be hydrogen at the same time.

4,898,801

MAGNETIC CARRIER OF DEVELOPER FOR ELECTROPHOTOGRAPHIC COPYING MACHINES COMPOSED OF FERRITE AND A SELECTED METAL OXIDE

Hidekiyo Tachibana; Akihiko Noda; Kazuo Terao, all of Kanagawa; Toshio Honjou, Chiba; Yukio Seki, Chiba; Hiroshi Endo, Chiba, and Toshio Yokobari, Chiba, all of Japan, assignors to Fuji Xerox Co., Ltd., Tokyo and Nippon Iron Powder Co., Ltd., Chiba, both of, Japan

Continuation-in-part of Ser. No. 871,171, Jun. 3, 1986, abandoned, which is a continuation of Ser. No. 663,980, Oct. 23, 1984, abandoned. This application Oct. 19, 1987, Ser. No. 111,137

Claims priority, application Japan, Oct. 24, 1983, 58-197500

Int. Cl.[4] G03G 9/10

U.S. Cl. 430—106.6 5 Claims

1. A carrier for a developer composed of a composition represented by the formula $(CuO)_a(ZnO)_b(Fe_2O_3)_c$ wherein a(mol)+b(mol)+c(mol)=1, $0.17 \leqq a+b/c < 0.42$, a is in the range from 0.1 to 0.3, b in the range from 0.05 to 0.15, and c in the range from 0.7 to 0.8, said composition having a bulk density of 1.8–3.4 g/cm^3 and a magnetization of 10–30 emu/g in a magnetic field of 450–500 Oe(oerested).

4,898,802

TONER COMPOSITIONS WITH ORGANO BORON NEGATIVE CHARGE ENHANCING ADDITIVES

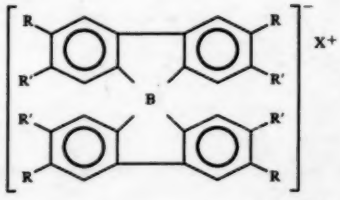
Bing R. Hsieh, Webster; Robert J. Gruber, and John L. Haack, both of Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 22, 1989, Ser. No. 354,181

Int. Cl.[4] G03G 9/08

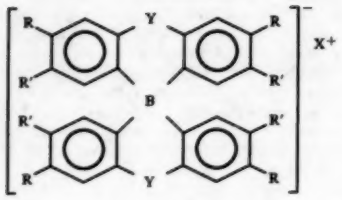
U.S. Cl. 430—110 26 Claims

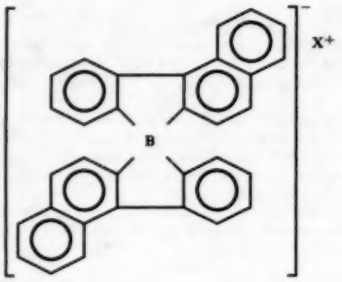
1. A negatively charged toner composition comprised of resin particles, pigment particles, and as a charge enhancing additive the salts of 5,5'-spirobi(5H-dibenzoborole) of the following Formulas I, II, III, IV, or V:

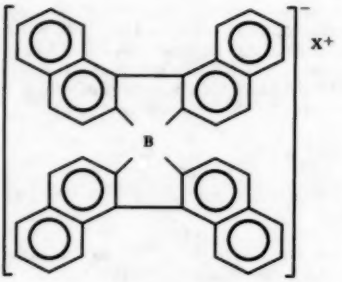


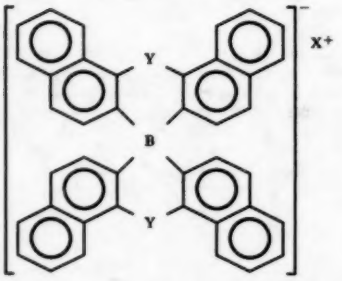
I

-continued









wherein R, and R′ are independently selected from the group consisting of hydrogen, an aliphatic group, and halide; Y is alkylene or hetroatoms; and X is a cation.

4,898,803

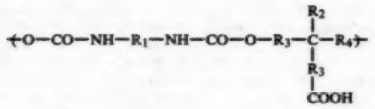
LIGHT-SENSITIVE O-QUINONE DIAZIDE COMPOSITION WITH ACIDIC POLYURETHANE RESIN

Toshiaki Aoai; Keitaro Aoshima, and Akira Nagashima, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

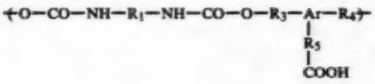
Filed Nov. 12, 1987, Ser. No. 119,578
Claims priority, application Japan, Nov. 14, 1986, 61-271554
Int. Cl.[4] G03C 1/60, 1/54, 1/495
U.S. Cl. 430—191 14 Claims

II 1. A light-sensitive composition comprising at least one polyurethane resin having at least one repeating unit represented by at least one of formula (I) and formula (II) and which is insoluble in water and soluble in an aqueous alkaline solution; and at least one positive-working light-sensitive o-quinonediazide compound:

III



(I)



(II)

in the above general formula, R_1 represents a bivalent aliphatic or aromatic hydrocarbon group which may have a substituent; R_2 represents a hydrogen atom or an alkyl, an aralkyl, an aryl, an alkoxy or an aryloxy group which may be substituted with a substituent; R_3, R_4 and R_5 may be the same or different and represent a single bond or a bivalent aliphatic or aromatic hydrocarbon group which may be substituted with a substituent; and Ar represents a trivalent aromatic hydrocarbon group

IV which may be substituted with a substituent,

wherein the amount of the o-quinonediazide compound is in the range of from 10 to 50% by weight of the composition.

the amount of the polyurethane resin in the light-sensitive composition falls within the range of from about 5 to 90% by weight of the composition.

the polyurethane resin has an acid value of 1.5 to 4.0 meq/g, and

the polyurethane resin and the o-quinonediazide compound are together in admixture.

V

4,898,804

SELF-ALIGNED, HIGH RESOLUTION RESONANT DIELECTRIC LITHOGRAPHY

Kurt Rauschenbach, Marlborough, Mass., and Charles A. Lee, Ithaca, N.Y., assignors to Cornell Research Foundation, Ithaca, N.Y.

Filed Mar. 31, 1988, Ser. No. 176,274
Int. Cl.[4] G03C 5/16
U.S. Cl. 430—311 20 Claims

1. A method for multi-surface lithography, comprising:

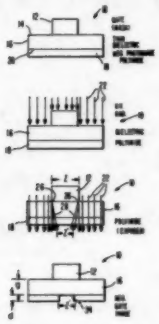
forming a thin-film of a semiconductor material having a resonant dielectric characteristic wherein a resonant dielectric increase occurs when said thin film material is exposed to light of a predetermined frequency;

forming a mask adjacent a top surface of said thin film;

forming a photoimageable layer on a bottom surface of said thin film beneath said mask, said photoimageable material being sensitive to light of said predetermined frequency;

directing light of said predetermined frequency from a colli-

mated source toward said top surface of said thin film, past said mask and through said thin film to expose, and to



produce an image in, said photoimageable layer which corresponds to the shape of said mask.

4,898,805

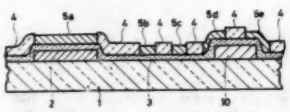
METHOD FOR FABRICATING HYBRID INTEGRATED CIRCUIT

Mitsuyuki Takada; Hayato Takasago, and Yoichiro Onishi, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 25, 1988, Ser. No. 224,175

Int. Cl.[4] G03C 5/00

U.S. Cl. 430—315 **11 Claims**



1. A method for fabricating a hybrid IC substrate comprising the steps of:

preparing an insulating ceramic substrate having a major surface,

baking one or more conductors of a first group on the major surface,

forming an insulating porous active layer including a glass component and a small amount of a metal component having a catalytic action for electroless plating to cause said active layer to cover said major surface and said conductors of the first group, and

forming one or more conductors of the second group by electroless plating on said active layer,

whereby a portions of said active layer sandwiched between said conductors of the first and the second groups is rendered conductive and a portions of said active layer in direct contact with said insulating substrate is maintained as an insulator.

4,898,806

COATED MATERIAL AND USE THEREOF

Josef Pfeifer, Therwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 105,515, Oct. 2, 1987, abandoned, which is a continuation of Ser. No. 845,891, Mar. 28, 1986, abandoned. This application Jan. 23, 1989, Ser. No. 302,076

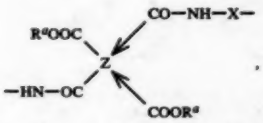
Claims priority, application Switzerland, Apr. 11, 1985, 1551/85

Int. Cl.[4] G03C 5/16; B05D 3/06

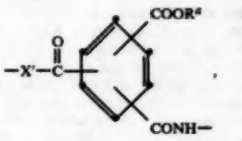
U.S. Cl. 430—325 **50 Claims**

26. A process for producing a relief image which comprises

(a) coating a substrate with a layer of a polyamic acid, which polymer contains 50 to 100 mol %, based on said polymer, of at least one structural unit of formula I or II

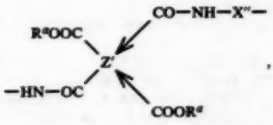


(I)

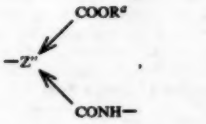


(II)

or of a mixture thereof, and 0 to 50 mol. % of a structural unit of formula III or IV



(III)



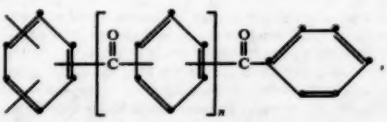
(IV)

or of a mixture thereof, wherein the arrows denote position isomerism and

R^a is a hydrogen atom,

Z is a tetravalent aromatic radical which contains a benzophenone structural unit and to which one —CONH and one —$COOR^a$ group is attached to one or two different phenyl radicals in ortho- or peri-position to each other, and where Z is a radical of formula V, VI, VII or XI

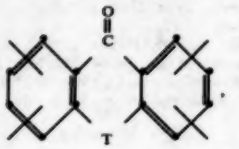
(V)



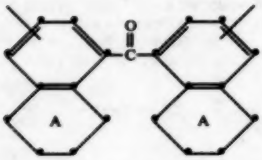
(VI)

-continued

(VII)



(XI)



wherein n is 0 or 1, T is a direct bond, $—CH_2—$, —O—, —S—, —SO—, $—SO_2—$, —CO—, $—NR^b—$ or $—CR^bR^c—$, wherein R^b is a hydrogen atom, C_1–C_{10}alkyl, naphthyl or benzyl, and Rc has the meaning of R^b but is not hydrogen, the rings A in formula XI are saturated or aromatic, and a pair of free bonds is ortho to each other,

Z' is a tetravalent aromatic radical which differs from Z and to which one ester group and one amide group are attached in ortho- or peri-position to each other,

Z' is a trivalent aromatic radical which differs from the radical in the structural unit of formula II and to which one ester and one amide group are attached in ortho- or peri-position to each other,

X is the radical of an aromatic diamine which is substituted in both ortho-positions to at least one N-atom by alkyl, cycloalkyl, alkoxy, alkoxyalkyl or aralkyl, or two adjacent carbon atoms of the aromatic radical are substituted by alkylene,

X' is a divalent aromatic radical which is substituted by at least one group as defined for X, and

X'' has the same meaning as X or is a divalent radical of an organic diamine which differs from the radical X,

(b) irradiating the coated material through a photomask,

(c) developing the image by treating the material with a solvent to remove the uncrosslinked polymer from the areas not exposed to irradiation, and

(d) heating the crosslinked image to convert said image to the corresponding polyimide form.

4,898,807

METHOD FOR FORMING DIRECT POSITIVE COLOR IMAGE USING AN N-HYDROXY ALKYL-SUBSTITUTED-P-PHENYLDIAMINE DERIVATIVE AT ELEVATED TEMPERATURES FOR A SHORT PERIOD OF TIME

Kazuhiro Kobayashi; Shigeharu Koboshi, and Kazuyoshi Miyaoka, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

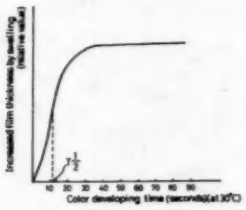
Continuation of Ser. No. 68,719, Jun. 29, 1987, abandoned, which is a continuation-in-part of Ser. No. 868,288, May 28, 1986, abandoned. This application May 1, 1989, Ser. No. 348,095

Claims priority, application Japan, May 31, 1985, 60-118443; Jun. 18, 1985, 60-132649; Jul. 12, 1985, 60-153699

Int. Cl.[4] G03C 7/16

U.S. Cl. 430—378 **22 Claims**

1. A method for forming a direct positive color image by subjecting an inner latent image type light-sensitive silver halide color photographic material for formation of a direct positive color image, having at least one light-sensitive emulsion layer containing inner latent image type silver halide grains which have not been previously fogged on the grain surfaces to color developing processing after image exposure, which comprises developing, an inner latent image type light-sensitive silver halide color photographic material for formation of a direct positive color image in which a silver halide emulsion, in at least one light-sensitive emulsion layer consists substantially of a silver chlorobromide emulsion by contact



with a color developing solution having a pH of 7 to 13 and containing a N-hydroxyalkyl-substituted-p-phenylenediamine derivative as a color developing agent in an amount of 1 to 100 g/l of said color developing solution at 30° C. to 50° C. for from 5 to 150 seconds.

4,898,808

ANTISTATIC SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Noriki Tachibana; Masato Nishizeki, and Nobuaki Kagawa, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jan. 17, 1989, Ser. No. 298,188

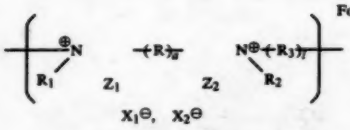
Claims priority, application Japan, Oct. 27, 1988, 63-271672

Int. Cl.[4] G03C 1/82; C08G 75/00; C07D 211/00

U.S. Cl. 430—510 **76 Claims**

1. An antistatic silver halide photographic light-sensitive material having a support, provided thereon, at least one light-sensitive layer and at least one non-light-sensitive layer, wherein said at least one non-light-sensitive layer comprises a polymer compound consisting essentially of a repeated structural unit represented by Formula [I];

Formula [I]



wherein Z_1 and Z_2 represent the group of the atoms necessary to form a six-membered ring with $—N^{\oplus}—$; R represents a divalent group; R_1 and R_2 represent independently one selected from the group consisting of an alkyl group and an aryl group; R_3 represents a hydrocarbon group; $X_1^{\ominus}$ and $X_2^{\ominus}$ represent an anion; a and l represent an integer of 0 and 1.

4,898,809

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Takeshi Sampei, Hino, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed Aug. 3, 1988, Ser. No. 227,754

Claims priority, application Japan, Aug. 11, 1987, 62-201125; Aug. 11, 1987, 62-201126

Int. Cl.[4] G03C 1/84

U.S. Cl. 430—523 **9 Claims**

1. A silver halide photographic light-sensitive material comprising a support bearing thereon photographic component layers including

at least one silver halide emulsion layer containing a silver halide emulsion sensitized so as to have a maximum spectral sensitivity on the side of a wavelength shorter than 600 nm; and

at least one non-light-sensitive hydrophilic colloid layer arranged to the side of said silver halide emulsion layer opposite to said support,

wherein at least one of said hydrophilic colloid layers contains a water-soluble dye having a maximum light-absorption within the wavelength region of not less than 700 nm.

4,898,810

LAYERS FOR PHOTOGRAPHIC MATERIALS

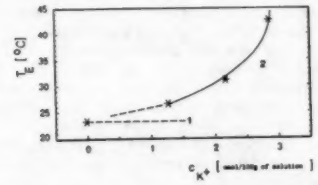
Ute Eggert, Fribourg; Andreas Engel, Binningen, and Ekkehard Kramp, Marly, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 143,054, Jan. 12, 1988, abandoned. This application May 1, 1988, Ser. No. 346,294

Claims priority, application Switzerland, Jan. 13, 1987, 00097/87-7

Int. Cl.[4] G03C *5/26, 1/00*; A23L *1/04*

U.S. Cl. 430—523 **26 Claims**



1. A photographic material, which contains, on a support, at least one light-sensitive layer with gellan gum, which with mono-, di- and/or trivalent metal ions, forms gels having a solidification temperature between 24° and 45° C.

4,898,811

COLOR PHOTOGRAPHIC SILVER HALIDE MATERIAL WITH SULFONYLPHENOL OIL FORMER

Erich Wolff, Solingen; Dieter Lowski, Bergheim, and Harry Elias, Leverkusen, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

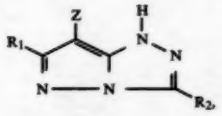
Filed Dec. 2, 1988, Ser. No. 279,415

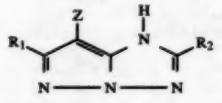
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1987, 3743006

Int. Cl.[4] G03C *7/38*

U.S. Cl. 430—546 **5 Claims**

1. A color photographic silver halide material which, in at least one silver halide emulsion layer, contains a magenta coupler corresponding to formula (I) or (II)


(I)


(II)

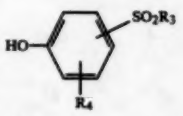
in which

R_1 represents alkyl, aryl or a ballast group,

R_2 is a ballast group, alkyl or aryl,

Z is hydrogen or a group releasable on reaction with the developer oxidation product,

and a compound corresponding to formula (III)


(III)

in which

R_3 represents alkyl, alkoxy, aryl, optionally substituted amino or the residue of a heterocycle,

R_4 represents COR_5, NHR_6, $S(O)_nR_7$

R_5 represents OR_8, NHR_8, alkyl, aryl or a heterocycle,

R_6 represents SO_2R_8, COR_8 or $CONHR_8$,

R_7 represents alkyl, aryl or NHR_8,

R_8 represents alkyl or aryl and

n is 0, 1 or 2,

with the exception of compounds in which R_3 represents a carboxymethoxyphenyl, carboxymethoxy, alkoxycarbonylmethoxy or alkoxycarbonylmethoxyphenyl radical substituted at the methylene group.

4,898,812

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL WITH A SILVER HALIDE EMULSION LAYER CONTAINING A CYAN COUPLER AND A COLOR DEVELOPMENT ACCELERATOR

Kozo Aoki, and Nobuo Furutachi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

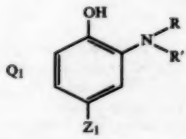
Filed Aug. 7, 1987, Ser. No. 82,461

Claims priority, application Japan, Aug. 7, 1986, 61-184329

Int. Cl.[4] G03C *7/34*

U.S. Cl. 430—548 **10 Claims**

1. A silver halide color photographic material comprising a support having thereon at least one silver halide emulsion layer, said emulsion layer containing at least one cyan dye forming coupler represented by the general formula (I):


(I)

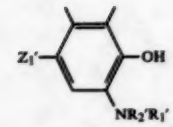
wherein,

Z_1 represents a hydrogen atom or a group that can be released in a coupling reaction with the oxidation product of a color developing agent;

R represents an acyl group or a sulfonyl group; and wherein

R′ represents a hydrogen atom or an aliphatic group having 1 to 8 carbon atoms which may be substituted with one or more substituents;

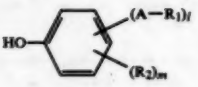
Q_1 represents a 5- to 8-membered ring comprising $—NR'—_3CO—Q'_1$, wherein the nitrogen atom of the group $—NR'_3CO—Q'_1$ is bonded to the carbon atom at the 5-position of the phenol ring portion of formula (I), wherein Q'_1 represents at least one divalent group selected from the group consisting of a divalent amino group, an ether linkage, a thioether linkage, an alkylene group, an ethylene linkage, an imino linkage, a sulfonyl group, a carbonyl group, an allylene group, a divalent heterocyclic ring group and a group represented by



wherein Z'_1 and R'_2 have the same meaning as Z_1 and R', respectively, as defined above; R'_1 represents a group represented by $—COX_1—R'_4$ or a group represented by $—SO_2—X_1R'_4$ wherein X_1 represents a group —O—, a group $—NR'_5—$ or a chemical bond wherein R'_5 represents a hydrogen atom or a substituted or unsubstituted aliphatic group having 1 to 8 carbon atoms, and R'_4 represents a substituted or unsubstituted aliphatic group; Z'_1, R'_1 and R_2 may be the same or different, and Q'_1 may be substituted or unsubstituted; R'_3 represents a hydrogen atom or a group represented by $—X_2R'_6$ that can be attached as a substituent to the nitrogen atom, wherein X_2 represents a chemical bond or one or more divalent linking groups that may have a substituent selected from the group consisting of a divalent amino group, an ether linkage, a thioether linkage, an alkylene group, an imino linkage, a sulfonyl group, a sulfoxy group, and a carbonyl group; and R'_6 has the same meaning as R'_4; and

a dimer coupler or a polymer coupler may be formed through R, R', Z_1, or Q_1;

and at least one color development accelerator represented by the formulae (II) or (V):



(II)

Q

$$R_5—NHSO_2—R_6 \qquad (V)$$

wherein,

A represents a divalent electron accepting group;

R_1 represents a substituted or unsubstituted aliphatic group, a substituted or unsubstituted aryl group, a substituted or unsubstituted alkoxy group, a substituted or unsubstituted aryloxy group, a substituted or unsubstituted alkylamino group, a substituted or unsubstituted anilino group, or a substituted or unsubstituted heterocyclic group;

l is 1 or 2;

R_2 represents a substituted or unsubstituted aliphatic group, a substituted or unsubstituted alkoxy group, a hydroxyl group or a halogen atom;

m is an integer of from 0 to 4;

Q, which may or may not be present, represents a benzene ring or a heterocyclic ring that may be condensed with the phenol ring;

R_5 represents a substituted or unsubstituted aliphatic group, a substituted or unsubstituted aryl group, a substituted or unsubstituted alkylsulfonyl or phenysulfonyl group or a substituted or unsubstituted acyl group; and

R_6 represents a substituted or unsubstituted aliphatic group or a substituted or unsubstituted aryl group; or

R_5 and R_6 may combine to form a 5- to 7-membered ring, which ring may be independent or may be part of a fused ring system.

4,898,813

CATALYTIC TEST COMPOSITION INTENDED TO PRODUCE A RANGE OF COLORS

James P. Albarella, 25845 Meadow Oak La.; Steven C. Charlton, 1533 Strong Ave.; James W. Reinsch, 3421 Whitfield Ct.-D, all of Elkhart, Ind. 46514, and Mary E. Warchal, 10272 Jefferson Rd., Osceola, Ind. 46561

Filed Apr. 4, 1986, Ser. No. 848,691

Int. Cl.[4] C12Q *1/00, 1/26, 1/54, 1/60*

U.S. Cl. 435—4 **19 Claims**

1. Process for determining the concentration of an analyte in a fluid sample, which process comprises:

contacting a common substrate generating system capable of generating a common substrate by reaction with an analyte of interest, with (a) an analyte, (b) a first catalytic system capable of generating a change in hue of a first indicator component by reaction with the common substrate, and (c) a second catalytic system capable of generating a change in hue of a second indicator component by reaction with the common substrate,

wherein the generation of the change in hues of the first and second indicator components occurs substantially simultaneously and provides different hues at different analyte concentrations, the final hue depending on the concentration of the analyte.

4. The test composition for the determination of the concentration of an analyte in a fluid sample, comprising:

(a) a common substrate generating system which in the presence of an analyte in a fluid sample will generate a common substrate selected from the group consisting of adenosine triphosphate, reduced flavin adenine dinucleotide, hydrogen peroxide, glycerol and glucose;

(b) a first catalytic system capable of generating a change in hue in a first indicator upon reaction with the common substrate; and

(c) a second catalytic system capable of generating a change in hue in a second indicator by reaction with the common substrate,

wherein the generation of the change in hues of the first and second indicators occurs substantially simultaneously and provides different hues at different analyte concentrations, the final hue produced by the test composition depending on the concentration of the analyte present in the fluid sample.

4,898,814

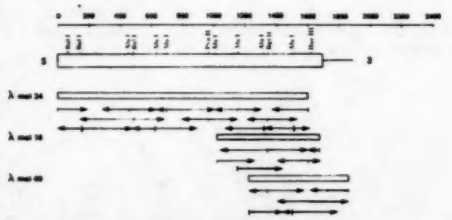
A CDNA CLONE FOR HUMAN TYROSINASE

Byoung S. Kwon, Vestal, N.Y., assignor to Donald Guthrie Foundation for Medical Research, Inc., Sayre, Pa.

Filed Oct. 6, 1986, Ser. No. 915,753

Int. Cl.[4] C12Q *1/68;* **C12N** *9/02, 15/00;* **C07H** *15/12*

U.S. Cl. 435—6 **6 Claims**



4. A method of making human tyrosinase comprising the steps of:

a. fusing the lambda mel 34 cDNA encoding human tyrosinase to an expression vector wherein said cDNA is under the functional control of a promoter sequence;

b. expressing tyrosinase in *E. coli;*

c. purifying the resulting tyrosinase.

6. A method of using the cDNA gene for human tyrosinase

recovered from the λ mel 34 cDNA as deposited at the A.T.C. Collection under No. 40265 as a probe for genetic analysis of human albinism comprising the steps:

(a) labeling said cDNA;

(b) hybridizing said labeled cDNA with albino human genomic DNA; and

(c) detecting the patterns of hybridization.

4,898,815

NOVEL SYNTHETIC PEPTIDE, PROCESS FOR ITS PREPARATION AND MEDICAMENTS CONTAINING IT

Andre Dodin, Milly La Foret; Odile Siffert, Versailles; Georgette Le Thuillier, Morangis, and Patrice Allard, Paris, all of France, assignors to Institut Pasteur, Paris, France

Division of Ser. No. 643,955, Aug. 24, 1984, Pat. No. 4,686,281. This application Jan. 20, 1987, Ser. No. 4,416

Claims priority, application France, Aug. 29, 1983, 83 13828

Int. Cl.[4] G01N *33/569;* A61K *39/40*

U.S. Cl. 435—7 **6 Claims**

1. Diagnostic agent for the presence of *V. cholerae* and/or toxinogenic *Escherichia coli,* said agent being essentially constituted by a serum taken from rabbits previously treated with injections of the synthetic peptide Gln-Ser-Leu-Gly-Val-Lys-Phe-Leu-Asp-Glu-Tyr-Gln-Ser-Lys-Val.

4,898,816

MEDIATORS FOR BIOELECTROCHEMICAL CELLS TO TEST FOR MICROBIOLOGICAL ACTIVITY

Anthony P. F. Turner; Ann Swain; Graham Ramsay; Marco Cardosi, and Bernard H. Schneider, all of Cranfield, England, assignors to Paul de la Pena Limited, Worcestershire, United Kingdom

Filed Mar. 19, 1987, Ser. No. 27,979

Claims priority, application United Kingdom, Mar. 19, 1986, 8606831; Nov. 25, 1986, 8628166

Int. Cl.[4] C12Q *1/04*

U.S. Cl. 435—34 **11 Claims**

1. In a bioelectrochemical cell for use in measuring microbiological activity in a liquid sample suspected of containing microorganisms, wherein microbiological activity results in a mediator transfer of electrons between liquid and electrode in the cell and a consequent electrical signal is detected and measured, the improvement which comprises incorporating in the cell an amount of a ferricyanide and a 1,4-benzoquinone effective for said mediation of electron transfer.

4,898,817

MICROORGANISM IMMOBILIZATION

Hiroshi Yamazaki, 22 Alderbrook Drive, Nepean, Ontario K2H 5W5, and Sushama Joshi, 37 Sheldrake Drive, Kanata Ontario K2L 1S5, both of Canada

Filed Jun. 16, 1986, Ser. No. 874,388

Claims priority, application Canada, Nov. 6, 1985, 494718

Int. Cl.[4] C12P *35/06, 17/18, 7/14;* C12N *11/02*

U.S. Cl. 435—49 **13 Claims**

1. A repetitive batch fermentation process for producing a fermentation product comprising the steps of:

(a) freely suspending and stirring small segments of support cloth bearing a fixed film of live and reproductive microorganisms immobilized thereon within a fermenter containing suitable nutrient liquor to carry out a fermentation process, whereby said microorganisms produce a fermented liquor;

(b) withdrawing said fermented liquor from said fermenter while retaining said small segments of support cloth bearing said fixed film of live and reproductive microorganisms immobilized thereon within said fermenter;

(c) adding fresh nutrient to said fermenter containing said small segments of support cloth bearing said fixed film of live and reproductive microorganisms immobilized thereon; and

(d) repeating steps (a), (b) and (c) a plurality of times to produce said fermentation product.

4,898,818

ANTITUMOR ACTIVE SUBSTANCE, PROCESS FOR PREPARING THE SAME, DRUG CONTAINING THE SUBSTANCE, GENE CODING FOR THE SUBSTANCE, VECTOR CONTAINING THE GENE AND RECOMBINANT MICROORGANISM

Satoru Nakai; Mayumi Kaneta; Yoshikazu Kikumoto, all of Tokushima; Yeong-Man Hong; Kazuyoshi Kawai, both of Naruto; Setsuko Takegata, Tokushima; Kiyoshi Ishii, Tokushima; Yasuo Yanagihara, Tokushima, and Yoshikatsu Hirai, Tokushima, all of Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Dec. 19, 1985, Ser. No. 810,776

Claims priority, application Japan, Dec. 21, 1984, 59-271207; Jun. 24, 1985, 60-138280; Jun. 24, 1985, 60-138281; Oct. 3, 1985, 60-220882

Int. Cl.[4] C12P *21/00;* C12N *15/00;* C07K *13/00*

U.S. Cl. 435—69.1 **2 Claims**

1. A process for preparing an antitumor active substance GIF comprising the steps of causing an antitumor substance inducing substance to act on an immunologically competent cell derived from a human and collecting the GIF substance by sequential chromatography comprising gel-filtration chromatography, reverse-phase chromatography and chromatofocusing or ion-exchange chromatography, and the GIF substance is substantially a homogeneous protein, contains as its component protein, polypeptide A, having the following primary structure, and has a molecular weight of 18,000 and an isoelectric point of 6.88 to 7.02

Ala	Pro	Val	Arg	Ser	Leu	Asn	Cys	Thr	Leu	Arg	Asp	Ser
Gln	Gln	Lys	Ser	Leu	Val	Met	Ser	Gly	Pro	Tyr	Glu	Leu
Lys	Ala	Leu	His	Leu	Gln	Gly	Gln	Asp	Met	Glu	Gln	Gln
Val	Val	Phe	Ser	Met	Ser	Phe	Val	Gln	Gly	Glu	Glu	Ser
Asn	Asp	Lys	Ile	Pro	Val	Ala	Leu	Gly	Leu	Lys	Glu	Lys
Asn	Leu	Tyr	Leu	Ser	Cys	Val	Leu	Lys	Asp	Asp	Lys	Pro
Thr	Leu	Gln	Leu	Glu	Ser	Val	Asp	Pro	Lys	Asn	Tyr	Pro
Lys	Lys	Lys	Met	Glu	Lys	Arg	Phe	Val	Phe	Asn	Lys	Ile
Glu	Ile	Asn	Asn	Lys	Leu	Glu	Phe	Glu	Ser	Ala	Gln	Phe
Pro	Asn	Trp	Tyr	Ile	Ser	Thr	Ser	Gln	Ala	Glu	Asn	Met
Pro	Val	Phe	Leu	Gly	Gly	Thr	Lys	Gly	Gly	Gln	Asp	Ile
Thr	Asp	Phe	Thr	Met	Gln	Phe	Val	Ser	Ser	OH.		

4,898,819

HETEROPOLYSACCHARIDE SOLUTIONS STABILIZED AGAINST VISCOSITY LOSS OVER TEMPERATURE AND TIME

Jean-Louis Linossier, Lyons, France, assignor to Rhone-Poulenc Specialities Chimiques, Courbevoie, France

Filed Dec. 5, 1985, Ser. No. 804,862

Claims priority, application France, Dec. 5, 1984, 84 18506

Int. Cl.[4] C12P *19/04*

U.S. Cl. 435—93 **9 Claims**

1. A process for stabilizing the viscosity of an aqueous saline solution of a heteropolysaccharide over temperature and time, comprising purging dissolved oxygen from such aqueous saline solution by degassing same with carbon dioxide, the ionic strength of which saline solution being such that said heteropolysaccharide exists therein in ordered form, and thence adding to said degassed solution an effective amount of a reducing/deoxidizing agent as to maintain the pH thereof at a value ranging from 5 to 7, said carbon dioxide and reducing agent preventing precipitation of insoluble materials.

4,898,820

PROCESS FOR PRODUCTION OF ISOMALTULOSE

Akio Hitoshio; Hisao Takamatsu, and Reiko Hattori, all of Tokyo, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 27, 1988, Ser. No. 224,611

Claims priority, application Japan, Jul. 27, 1987, 62-185594; Jul. 22, 1988, 63-181695

Int. Cl.[4] C12P *19/12*

U.S. Cl. 435—95 **4 Claims**

1. A process for production of isomaltulose characterized by reacting glucose and fructose to form isomaltulose in the presence of an enzyme which hydrolyzes a polysaccharide or oligosaccharide at the α-1, 4- and/or α-1,6-glucoside linkage thereof by an exo-type cleavage.

4,898,821

ANTIBIOTIC COMPOUNDS AND THEIR PREPARATION

John B. Ward, Bushey; Hazel M. Noble, Burnham; Neil Porter, Pinner; Richard A. Fletton, Ruislip, and David Noble, Burnham, all of England, assignors to American Cyanamid Company, Stamford, Conn.

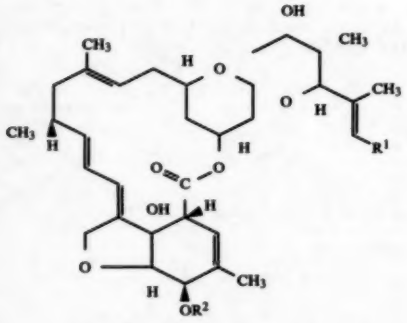
Division of Ser. No. 775,737, Sep. 13, 1985, abandoned. This application Mar. 25, 1987, Ser. No. 29,885

Claims priority, application United Kingdom, Sep. 14, 1984, 8423278; Dec. 21, 1984, 8432519

Int. Cl.[4] C12P *17/18*

U.S. Cl. 435—119 **13 Claims**

1. A process for the preparation of a compound having a formula (III)



(III)

or mixtures thereof, in which R^1 is a methyl, ethyl or isopropyl group and R^2 is hydrogen or a methyl group; which comprises the step of cultivating a microorganism which is *Streptomyces thermoarchaensis* NCIB 12015, 12111, 12112, 12113 or 12114.

4,898,822

PROCESS FOR PREPARING OPTICALLY ACTIVE INDOLINE-2-CARBOXYLIC ACID

Masanori Asada, Takasago; Shigeki Hamaguchi; Hidetoshi Katsuki, both of Kobe; Yoshio Nakamura, Takasago; Hideyuki Takahashi, Kakogawa, all of Japan; Kenji Takahara, Bronx, N.Y.; Yoshio Shimada, Kakogawa, Japan; Takehisa Ohashi, Kobe, Japan, and Kiyoshi Watanabe, Akashi, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

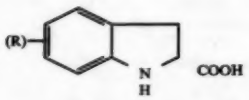
Filed Mar. 31, 1986, Ser. No. 846,436

Claims priority, application Japan, Apr. 1, 1985, 60-69769; May 20, 1985, 60-109160; Jun. 8, 1985, 60-124879

Int. Cl.[4] C12P *17/10, 1/04;* C12N *9/18;* C07P *41/00*

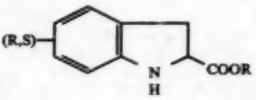
U.S. Cl. 435—121 **9 Claims**

1. A process for preparing an (R)-indoline-2-carboxylic acid having the formula [(R)-II]:



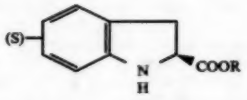
[(R)-II]

which comprises subjecting a racemic ester of an (R,S)-indoline-2-carboxylic acid having the formula [(R,S)-I]:



[(R,S)-I]

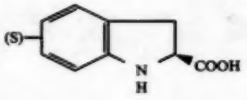
wherein R is an alkyl or alkenyl group having 1 to 10 carbon atoms; an alkyl or alkenyl group having 1 to 10 carbon atoms substituted with either hydroxyl group or a halogen atom, or simultaneously substituted with both hydroxyl group and a halogen atom; or a substituted or unsubstituted aromatic hydrocarbon group, to the action of an enzyme selected from the group consisting of Protease Amano P, Bioplase AL 15, Actinase E, Pancreatic digesting enzyme TA, Steapsin and Lipase L 3216, or a microorganism selected from the group consisting of *Aspergillus melleus* IFO 4420, *Bacillus subtilis* IFO 3018, *Streptomyces griseus* IFO 8358, *Saccharomyces cerevisiae* HUT 7018, *Trichosporon cutaneum* IFO 1200, *Aeromonas hydrophila* IFO 3820, *Arthrobacter paraffineus* ATCC 21317, *Arthrobacter nicotianae* IFO 14234, *Acidiphilium cryptum* IFO 14242, *Brevibacterium protophormiae* IFO 12128, *Corynebacterium paurometabolum* IFO 12160 and *Pseudomonas oxalacticus* IFO 13593, or a stereoselective esterase from any of these microorganisms, to asymmetrically hydrolyze the racemic ester [(R,S)-I] into optically active (R)-indoline-2-carboxylic acid [(R)-II] and an ester of (S-indoline-2-carboxylic acid having the formula [(S)-I]



[(S)-I]

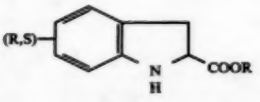
wherein R is as above, and then isolating the optically active (R)-indoline-2-carboxylic acid [(R)-II].

3. A process for preparing an (S)-indoline-2-carboxylic acid having the formula [(S)-II]:



[(S)-II]

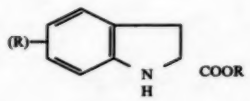
which comprises subjecting a racemic ester of an (R,S)-indoline-2-carboxylic acid having the formula [(R,S)-I]:



[(R,S)-I]

wherein R is an alkyl or alkenyl group having 1 to 10 carbon atoms; an alkyl or alkenyl group having 1 to 10 carbon atoms substituted with either hydroxyl group or a halogen atom, or simultaneously substituted with both hydroxyl group and a

halogen atom, or a substituted or unsubstituted aromatic hydrocarbon group, to the action of an enzyme selected from the group consisting of Lipoprotein lipase and Lipase AP 6, or a microorganism selected from the group consisting of *Pseudomonas aeruginosa* IFO 3080, *Aspergillus niger* IFO 4407, *Arthrinium phaeospermum* IFO 5703, *Aspergillus ficuum* IFO 4280, *Cephalosporium mycophilum* IFO 8580, *Echinopodospora jamaicensis* IFO 30406, *Emericellopsis glabra* IFO 9031, *Hypocrea lactea* IFO 8434, *Isaria atypicola* IFO 9205, *Lepista nuda* IFO 8104, *Nectria flammea* IFO 30306, *Pestalotiopsis distincta* IFO 9981, *Phialophora fastigiasta* IFO 6850, *Podospora carbonaria* IFO 30924, *Botryoascus synnaedendrus* IFO 1604, *Candida diversa* IFO 1090, *Citeromyces matritensis* IFO 0651, *Debaryomyces hansenii* IFO 0015, *Hormoascus platypodis* IFO 1471, *Moniliella tomentosa* CBS 22032, *Kluyveromyces fragilis* IFO 0288, *Nadsonia elongata* IFO 0665, *Rhodotorula glutinis* IAM 4642, *Schizosaccharomyces pombe* IFO 0347, *Torulopsis gropengiesseri* IFO 0659, *Wickerhamia fluorescens* IFO 1116, *Alcaligenes faecalis* IFO 12669, *Arthrobacter crystallopoietes* IFO 14235, *Brevibacterium flavum* ATCC 21269, *Protaminobacter alboflavus* IFO 3707 and *Pseudomonas acidovorans* IFO 13582, or a stereoselective esterase from any of these microorganisms, to asymmetric hydrolyze the racemic ester [(R,S)-I] into optically active (S)-indoline-2-carboxylic acid [(S)-II] and an ester of (R)-indoline-2-carboxylic acid having the formula [(R)-I]:



[(R)-I]

wherein R is as above, and then isolating the optically active (S)-indoline-2-carboxylic acid [(S)-II].

4,898,823

DNA SEQUENCE

Alan J. Kingsman, and Susan M. Kingsman, both of Islip, England, assignors to Celltech Limited, Sough, England

PCT No. PCT/GB84/00189, § 371 Date Jan. 30, 1985, § 102(e) Date Jan. 30, 1985, PCT Pub. No. WO84/04757, PCT Pub. Date Dec. 6, 1984

Continuation of Ser. No. 697,584, Jan. 30, 1985, abandoned. This PCT application May 31, 1984, Ser. No. 165,388

Claims priority, application United Kingdom, May 31, 1983, 8314961

Int. Cl.[4] C12N *15/00, 1/20, 5/00*

U.S. Cl. 435—172.3 **5 Claims**

1. An isolated upstream activator sequence (UAS) derived from the Saccharomyces phosphoglycerate kinase (PGK) gene which is contained in the 5' region of the PGK gene between nucleotides -324 and -456, which UAS when inserted upstream of a yeast promotor is capable of potentiating the efficiency thereof.

4,898,824

CROSSLINKED POLYACRYLAMIDE-SULFHYDRYL POLYMER FOR IMMOBILIZATION OF BIOLOGICALLY ACTIVE SUBSTANCES

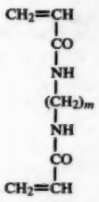
Kin-Fai Yip, Elkhart, Ind., assignor to Miles Inc., Elkhart, Ind.

Filed Dec. 9, 1986, Ser. No. 939,904

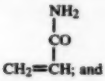
Int. Cl.[4] C12N *11/08, 11/06*

U.S. Cl. 435—180 **12 Claims**

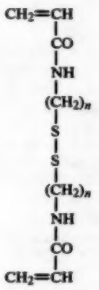
1. A method for preparing a water-insoluble crosslinked polyacrylamide polymer and immobilizing a biologically active substance thereon which comprises copolymerizing a mixture comprising monomers of the formulae:



(a)



(b)



(c)

wherein m and n are, independently, integers from 1 through 6, and, isolating the resulting crosslinked polyacrylamide polymer, reducing said crosslinked polymer with a reducing agent to cleave the disulfide bond in the crosslinkages of monomer (c) to result in a crosslinked polymer free of residual amino and carboxylic acid groups and to form chemically active sulfhydryl groups, and reacting the reduced crosslinked polymer with a biologically active substance to couple said biologically active substance to said chemically active sulfhydryl group.

4,898,825

METHODS FOR PURIFICATION OF SINGLE-CHAIN AND DOUBLE-CHAIN TISSUE PLASMINOGEN ACTIVATOR

Mitsuyoshi Morii; Masaharu Ohoka, both of Yokohama; Toshihiko Suzuki, Tokyo; Katsuyuki Suzuki, Hiroshima; Nobuhiro Kawashima, Sagamihara; Noriko Morii, and Kunizo Mori, both of Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Apr. 29, 1987, Ser. No. 43,746

Claims priority, application Japan, May 7, 1986, 61-103200; Aug. 11, 1986, 61-186850

Int. Cl.[4] C12N *9/48, 9/64*

U.S. Cl. 435—212 **18 Claims**

1. A method for separately purifying and separating single-chain tissue plasminogen activator (tPA) and double-chain tPA from a mixture containing both, which method comprises the steps of:

(a) bringing a mixture containing single-chain tPAs and double chain tPAs into close contact with a column carrying an immobilized Erythrina trypsin inhibitor as an affinity agent to adsorb said tPAs onto said column;

(b) treating said column with an eluent having a pH ranging from 4.5 to 6.0 to selectively elute single-chain tPA; and

(c) treating said column with an eluent having a pH lower than 4.5 to selectively elute double-chain tPA.

4,898,826

METHOD TO SOLUBILIZE TISSUE PLASMINOGEN ACTIVATOR

Stephen A. Duffy, Florissant; Christopher P. Prior, Ballwin, both of Mo., and Randal W. Scott, Sunnyvale, Calif., assignors to Invitron Corporation, St. Louis, Mo.

Filed Dec. 10, 1987, Ser. No. 130,901

Int. Cl.[4] C12N *9/64, 9/48, 9/50*; A61K *37/547*

U.S. Cl. 435—226 **8 Claims**

1. A method to enhance the solubility of tissue plasminogen activator (tPA) in aqueous medium, which method comprises dissolving said tPA in an aqueous medium containing a basic amino acid at a concentration of 0.02–0.2 M and a citric acid moiety at a concentration of 0.02–0.08 M, at a pH of 5–8.

4,898,827

METAL RECOVERY

James A. Brierley; Corale L. Brierley, both of Wheat Ridge, Colo.; Raymond F. Decker, Houghton, Mich., and George M. Goyak, Harmony, Pa., assignors to Advanced Mineral Technologies, Inc., Golden, Colo.

Continuation-in-part of Ser. No. 777,061, Sep. 20, 1985, Pat. No. 4,690,894, which is a continuation-in-part of Ser. No. 661,917, Oct. 17, 1984, abandoned. This application Jul. 3, 1986, Ser. No. 882,763

The portion of the term of this patent subsequent to Sep. 1, 2004, has been disclaimed.

Int. Cl.[4] C12N *1/38, 1/14, 1/06*; C02F *3/00*

U.S. Cl. 435—244 **30 Claims**

1. A process for enhancing the metal uptake properties of *Bacillus subtilis* from aqueous solutions containing metal cations, which comprises:

treating cells of said *Bacillus subtilis* characterized by cell walls with an amount of caustic solution maintained at an elevated temperature above ambient and ranging up to boiling at a pH in excess of 9 sufficient to form a caustic-ized biomass reaction product consisting essentially of material derived from the cell walls thereof having enhanced metal uptake properties,

and thereafter recovering, washing to remove excess caustic and drying said treated biomass to form a relatively solid, stable product thereof,

immobilizing said biomass reaction product in the particulate state in an insoluble organic binder said immobilized biomass reaction product in said particulate state being characterized by substantially enhanced metal uptake as compared to the metal uptake of the *Bacillus subtilis* in the untreated state.

4,898,828

ULTRAHIGH COPY NUMBER STREPTOMYCETES PLASMIDS

Charles L. Hershberger, New Palestine; Jeffrey L. Larson, and Patricia A. Reynolds, both of Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 763,172, Aug. 7, 1985, abandoned. This application Mar. 20, 1986, Ser. No. 841,920

Int. Cl.[4] C12N *1/20, 15/00*; C07H *21/04*

U.S. Cl. 435—252.3 **30 Claims**

1. A recombinant DNA Streptomyces vector comprising:

(a) a DNA sequence conferring a pleiotropic copy number phenotype and having at least the SCP2* minimal replicon of the approximately 1.4 kb BclI-Sau3A origin of replication-containing restriction fragment of the SCP2* replicon but no more than the approximately 2.2 kb origin of replication-containing BamHI restriction fragment of the SCP2* replicon, and

(b) one or more DNA segments that convey resistance to at least one antibiotic when transformed into a sensitive, restrictionless host cell.

4,898,829

APPARATUS FOR THE DETECTION OF BIODEGRADABLE AND TOXIC SUBSTANCES IN AQUEOUS SOLUTIONS

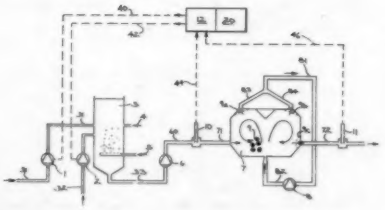
Friedrich W. Siepmann, Frankfurter Str. 10, D-6100 Darmstadt, and Michael Teutscher, Heinrichstr. 5, D-6111 Otzberg 4, both of Fed. Rep. of Germany

Division of Ser. No. 693,836, Jan. 23, 1985, Pat. No. 4,748,127, which is a continuation of Ser. No. 387,873, Jun. 10, 1982, abandoned. This application Dec. 14, 1987, Ser. No. 132,267

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1980, 3038305; PCT Int'l Appl., Oct. 10, 1981, PCT/EP81/00162

Int. Cl.[4] C12M *1/36, 1/34*

U.S. Cl. 435—289 **42 Claims**



1. Apparatus for measuring the degree of pollution of an aqueous liquid resulting from biodegradable components contained in the aqueous liquid, said apparatus comprising:

first means for providing a sample stream of the aqueous liquid;

second means for providing biologically neutral water to the sample stream to provide a diluted sample stream;

means for obtaining oxygenation of the diluted sample stream to provide an oxygenated, diluted sample stream;

a reaction vessel having an inlet and an outlet, said inlet receiving the oxygenated, diluted sample stream, said reaction vessel containing a biological bath having an essentially constant microbiological living mass for which the biodegradable components of the aqueous liquid act as nutrients and in which oxygen is consumed in biodegrading the biodegradable components;

means for determining the oxygen consumption in said reaction vessel and means coupled to said first and second means for regulating, via said first and second means, the amount of dilution of the sample stream to maintain essentially constant oxygen consumption in said reaction vessel while providing a constant volumetric flow rate of the oxygenated diluted sample stream through the reacion vessel; and

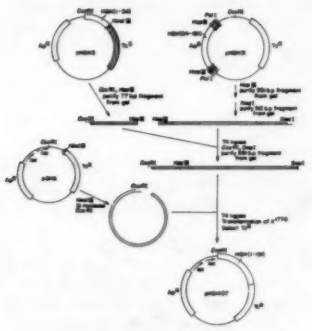
means for indicating the degree of pollution of the aqueous liquid in accordance with the amount of dilution of the sample stream.

4,898,830

HUMAN GROWTH HORMONE DNA

David V. Goeddel, and Herbert L. Heyneker, both of Burlingame, Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Continuation of Ser. No. 654,340, Sep. 25, 1984, Pat. No. 4,658,021, Division of Ser. No. 356,564, Mar. 9, 1982, Pat. No. 4,601,980, Division of Ser. No. 55,126, Jul. 5, 1979, Pat. No. 4,342,832. This application Apr. 13, 1987, Ser. No. 37,319
The portion of the term of this patent subsequent to Jul. 22, 2003, has been disclaimed.
Int. Cl.[4] C12N *1/00, 15/00*
U.S. Cl. 435—320 5 Claims



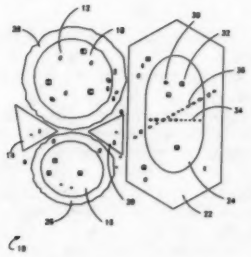
1. A DNA molecule consisting of DNA encoding amino acids 1–191 of human growth hormone.

4,898,831

METHOD AND APPARATUS FOR ANALYZING FLUID INCLUSIONS

Michael P. Smith, Tulsa, Okla., assignor to Amoco Corporation, Chicago, Ill.

Filed May 18, 1987, Ser. No. 51,555
Int. Cl.[4] G01N *33/24*
U.S. Cl. 436—32 23 Claims



1. A method for deriving information relating to geologic processes which form naturally-occurring mineral useful in the exploration of oil and gas, said method comprising the steps of:

providing a sample comprising a cut polished section of sedimentary rock containing a plurality of microscopic fluid inclusions of less than 50 microns in diameter, the fluid inclusions being of interest in the exploration for oil and gas;

characterizing a class of said microscopic fluid inclusions of less than 50 microns in diameter which are formed in such sample;

identifying and selecting in the sample a single microscopic fluid inclusion within said characterized class;

mechanically rupturing in the sample essentially only the identified and selected microscopic fluid inclusion; and

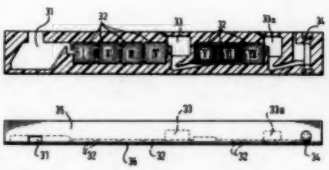
analyzing gases released from said fluid inclusion.

4,898,832

PROCESS FOR CARRYING OUT ANALYTICAL DETERMINATIONS AND MEANS FOR CARRYING OUT THIS PROCESS

Sigmar Klose, Berg, and Fritz Stähler, Tutzing, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Continuation of Ser. No. 413,012, Aug. 30, 1982, abandoned. This application Jan. 25, 1988, Ser. No. 147,610
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1981, 3134611
Int. Cl.[4] G01N *21/07*
U.S. Cl. 436—45 5 Claims



1. Process for analyzing a liquid sample, comprising:

(a) transporting a fluid sample from a sample application point to a soluble dry reagent containing zone on a transport path;

(b) mixing and incubating said fluid sample with said dry reagent to form a reaction-mixture; and

(c) transporting said reaction mixture to a reaction-mixture measurement point on said transport path at which point a parameter of said reaction mixture is measured, wherein transport of said fluid sample and said reaction mixture takes place on at least a part of said transport path by interaction of a first, surface force between said fluid sample or said reaction-mixture and said transport path and a second, controllably variable centrifugal force, said second controllably variable centrifugal force being less than said surface force on said at least part of said transport path so as to cause said fluid sample or reaction-mixture to move in a direction opposite the direction of said controllably variable centrifugal force during transport of the fluid sample from the application point to the dry reagent zone and the reaction mixture from the dry reagent zone to the point of measurement.

4,898,833

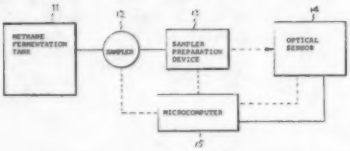
METHOD FOR MEASURING CELL COUNTS AND/OR METHANE PRODUCING ACTIVITY OF METHANOGENS

Satoshi Ueyama, and Satoru Isoda, Hyogo, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 16, 1987, Ser. No. 62,579
Int. Cl.[4] G01N *33/48*
U.S. Cl. 436—63 32 Claims

24. A method for measuring viability of Methanogens which comprises a first treatment, which comprises conducting a first extraction, applying heat to a first Methanogens-containing fraction of a sample to be analyzed thereby extracting out of said Methanogens a particular fluorescent substance inherent to and contained in said Methanogens to obtain an extracted liquid, a first separation of applying a solid-liquid separating procedure for removing solid particles greater than a predetermined particle size containing Methanogens from said ex-

tracted liquid containing said particlular fluorescent substance thereby obtaining an extracted and separated liquid containing said particular fluorescent substance, a first measurement of irradiating an excitation light in a first particular wavelength region to said extracted and separated liquid thereby measuring fluoresence intensity in a second particular wavelength region emitted from extracted and separated liquid, thereby obtaining a first measured value, and a second treatment, comprising a second separation of applying said solid-liquid separating procedure for removing solid particles greater than said predetermined particle size, to a second fraction of the Methanogens-containing sample, thereby obtaining a solid-liquid separated liquid, a second extraction by applying heat to said



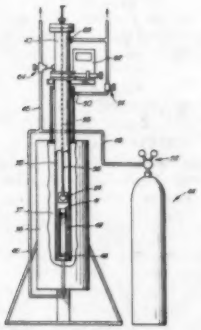
solid-liquid separated liquid thereby obtaining a separated and extracted liquid, a second measurement of irradiating an excitation light in said first particular wavelength region to said separated and extracted liquid, a second measurement of irradiating an excitation light in said first particular wavelength region to said separated and extracted liquid, thereby measuring fluorescence intensity in said second particular wavelength region radiated from said separated and extracted liquid, thereby obtaining a second measured value, and performing a predetermined data processing based on the first and the second measured values thereby obtaining a calculated value for the viability of Methanogens in said Methanogens-containing sample.

4,898,834

OPEN-TUBE, BENIGN-ENVIRONMENT ANNEALING METHOD FOR COMPOUND SEMICONDUCTORS

Arthur H. Lockwood, Goleta, and Adela Gonzales, Santa Barbara, both of Calif., assignors to Amber Engineering, Inc., Goleta, Calif.

Filed Jun. 27, 1988, Ser. No. 211,839
Int. Cl.[4] H01L *21/265*
U.S. Cl. 437—22 **13 Claims**



1. A method for annealing ion implanted junctions in indium antimonide wafers, employing a furnace having resealable means for accessing said furnace, comprising the steps of:

maintaining said furnace at a predetermined annealing temperature;

providing an indium-antimony atmosphere within said furnace, said indium and antimony being provided at their equilibrium vapor pressure at said annealing temperature;

inserting said wafer into said furnace and into contact with said atmosphere through said resealable means for accessing said furnace;

maintain said wafer in said furnace for a predetermined annealing time; and

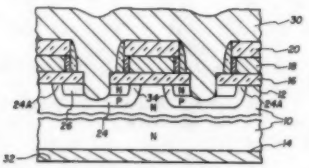
removing said wafer from said furnace and said atmosphere through said resealable means for accessing at the end of said predetermined time while maintaining said indium-antimony atmosphere within said furnace.

4,898,835

SINGLE MASK TOTALLY SELF-ALIGNED POWER MOSFET CELL FABRICATION PROCESS

Billy G. Cawlfield, Dallas, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Oct. 12, 1988, Ser. No. 256,505
Int. Cl.[4] H01L *21/40*
U.S. Cl. 437—29 **5 Claims**



1. A process for making a multicell power MOSFET comprising the steps of

preparing a monocrystalline silicon wafer whose bulk is of one conductivity type,

forming in turn over one surface of the wafer a thermally-grown oxide layer and a polysilicon layer,

oxidizing the top surface portion of the polysilicon layer to form of it a polyoxide layer,

forming openings at least through the polyoxide and polysilicon layers for defining localized portions of the wafer,

introducing donor and acceptor ions into the silicon wafer by way of said openings for forming an enclosed surface zone of the one conductivity type, adjacent each of said openings and a separate zone of the opposite conductivity enclosing each of said surface zones, each of the enclosing zones including a surface region essentially all of which underlies the polysilicon layer so that, when inverted, it can serve as a conductive channel between the enclosed surface zone of the one conductivity type and the bulk of the wafer of the one conductivity type,

forming an insulating layer over the edges of the polysilicon layer exposed in each opening,

depositing a conductive layer over the polyoxide layer and in the openings for penetrating the thermally-grown oxide layer in the openings and making low resistance electrical

connection at least to each of the surface regions of the one conductivity type,

and providing a separate low resistance electrical connection to the bulk of the wafer.

4,898,836

PROCESS FOR FORMING AN INTEGRATED CIRCUIT ON AN N TYPE SUBSTRATE COMPRISING PNP AND NPN TRANSISTORS PLACED VERTICALLY AND INSULATED ONE FROM ANOTHER

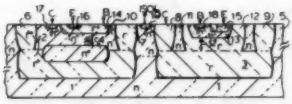
Raffaele Zambrano, Mercato San Severino, and Salvatore Musumeci, Riposto, both of Italy, assignors to SGS-Thomson Microelectronics S.R.L., Agrate Brianza, Italy

Filed Apr. 21, 1989, Ser. No. 341,540

Claims priority, application Italy, Apr. 28, 1988, 20357 A/88

Int. Cl.[4] H01L 27/02

U.S. Cl. 437—31 **2 Claims**



1. Process for forming an integrated circuit on a substrate of N type semiconductor material, comprising PNP and NPN transistors with vertical current flow, insulated from each other, in which:

P+ type regions are diffused on the N type substrate, said regions constituting the horizontal isolation region (2) of the NPN transistors and the low-resistivity collector region (3) of the PNP transistors,

within the isolation region (2) a high-concentration N+ type zone (4) is diffused, said zone acting as a low-resistivity collector region for the NPN transistor,

an N type epitaxial layer (5) is then grown all over the surface of the device,

P+ type regions (6) and (7) are then diffused until they join with region (2), so as inside to define a region (10), and P+ type regions (8) and (9) are diffused until they join with region (3), so as inside to define a region (11), regions (6), (2) and (7) all together acting as an isolation region for the NPN transistor, regions (3), (8) and (9) all together acting as a collector region for the PNP transistor,

within the N type region (11), a P type region (12) is diffused to act as a low-concentration collector region for the PNP transistor,

within the P type region (12), an N type region (13) is diffused to act as the base of the PNP transistor,

within the N type regions (10) and (13), P type regions (14) and respectively (15) are diffused to act as the base of the NPN transistor and respectively as the emitter of the PNP transistor,

within the P type region (14), an N type region (16) is diffused to act as the emitter of the NPN transistor,

said diffusions of regions (2) and (4) being made to give the region (2) a surface concentration lower than that of the region (4), characterized in that said region 14 is realized in such a way to ensure that the low-concentration collector thickness (s1) of transistor NPN be practically equal to the low-concentration collector thickness (s2) of transistor PNP.

4,898,837

METHOD OF FABRICATING A SEMICONDUCTOR INTEGRATED CIRCUIT

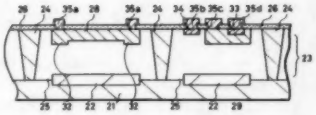
Kazuo Takeda; Nobuyuki Sekikawa; Katsuhiro Hayasaka; Chikao Fujunuma; Nobuo Itoh, and Tetsuya Kubota, all of Gunma, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Nov. 15, 1988, Ser. No. 271,748

Claims priority, application Japan, Nov. 19, 1987, 62-292415; Nov. 19, 1987, 62-292416; Nov. 19, 1987, 62-292420; Dec. 17, 1987, 62-320337; Dec. 25, 1987, 62-331176

Int. Cl.[4] H01L 21/265

U.S. Cl. 437—31 **13 Claims**



1. A method of fabricating a semiconductor integrated circuit comprising the steps of:

preparing a semiconductor substrate of a first conductivity type,

forming buried layers of a second conductivity type opposite to the first conductivity type in predetermined regions of said semiconductor substrate,

forming an epitaxial layer of the second conductivity type covering said substrate and said buried layers,

forming isolation regions of the first conductivity type dividing said epitaxial layer into a plurality of islands,

selectively implanting ions to form a base region of the first conductivity type of a vertical bipolar transistor in a surface layer of one island and simultaneously to form a resistor region in a surface layer of another island, said selectively implanting including effecting a first ion implantation and a second ion implantation,

selectively doping impurities of the first conductivity type during the first ion implantation into not only the resistor region but also the base region of the vertical bipolar transistor thereby determining impurity concentration in said resistor region,

further selectively doping impurities of the first conductivity type during the second ion implantation into said base region thereby determining an impurity concentration in said base region,

causing the impurities doped during the first and second ion implantation to be diffused to a prescribed depth in said base region, and

selectively diffusing impurities of the second conductivity type into a surface layer of said base region, to form an emitter region of the vertical bipolar transistor.

4,898,838

METHOD FOR FABRICATING A POLY EMITTER LOGIC ARRAY

Francis J. Morris, Plano, and Stephen A. Evans, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 16, 1985, Ser. No. 787,872

Int. Cl.[4] H01L 21/20, 21/265, 29/56, 29/64

U.S. Cl. 437—31 **11 Claims**

1. A method of fabricating a Schottky transistor, comprising:

providing a semiconductor substrate having a collector region of a first conductivity type;

forming a semiconductor layer of the first conductivity type on the collector region, the semiconductor layer having an exterior surface and a base region within the collector region and near the exterior surface;

forming a first insulating layer on the semiconductor layer;

doping the base region to be of a second conductivity type;

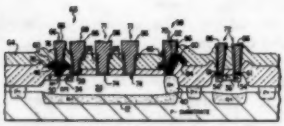
heavily doping a collector contact region to be of the first conductivity type, the collector contact region being a portion to the semiconductor layer and extending from the collector region to the first insulating layer, the collector contact region being spaced from the base region;

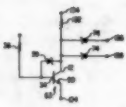
opening first and second orifices from the exterior through the first insulating layer to the semiconductor layer, the first orifice exposing a first area formed on the base region, the second orifice exposing a second area formed on the collector contact region;

forming first and second polysilicon bodies, the first body extending into the first orifice and contacting the first area, the second body extending into the second orifice and contacting the second area, the exterior surface area of the first and second bodies being greater than the respective first and second areas;

heavily doping the polysilicon bodies with a dopant to be of the first conductivity type;

annealing the first polysilicon body and the base region such that dopant diffuses into the first area from the first polysilicon body, the diffusion creating an emitter region of a first conductivity type within the base region;





doping a second base region to be of the second conductivity type with a doping concentration that is greater than that of said base region, the second base region being a portion of the semiconductor layer adjacent to the base region and the first insulating layer and spaced from the collector and collector contact regions;

opening a third orifice in the first insulating layer to expose a third area of the semiconductor layer, the third area adjoining a portion of the second base region and a Schottky diode region adjacent to the second base region, the Schottky diode region comprising a portion of the semiconductor layer of the first conductivity type, the third area being spaced from the base and collector contact regions;

forming separate conductive layers on the polysilicon bodies and across the third area, the conductive layers having edges and central areas;

forming a second passivating and insulating layer on the conductive layers and adjacent areas of the first insulating layer and to fill the third orifice;

opening vias in the second insulating layer to the central areas of the conductive layers, the edges of the conductive layers not being exposed; and

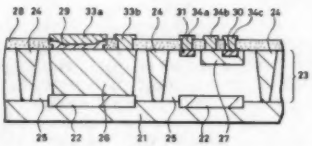
forming conductive leads in the vias to provide base, emitter, collector and Schottky diode connections.

4,898,839

SEMICONDUCTOR INTEGRATED CIRCUIT AND MANUFACTURING METHOD THEREFOR

Chikao Fujisuma; Nobuyuki Sekikawa; Teruo Tabata; Tadayoshi Takada; Yoshiaki Sano, and Toshimasa Sadakata, all of Gunma, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Nov. 15, 1988, Ser. No. 271,746
Int. Cl.[4] H01L *27/04*
U.S. Cl. 437—33 **8 Claims**



1. A method for manufacturing a semiconductor integrated circuit comprising the steps of:

preparing a semiconductor substrate of a first conductivity type;

forming buried layers of a second conductivity type on prescribed regions of the substrate;

forming an epitaxial layer of the second conductivity type covering said substrate and said buried layers;

forming isolation regions of the first conductivity type dividing said epitaxial layer into a plurality of islands and simultaneously forming a lower electrode region of a MIS type capacitor in one of said islands;

forming a base region of a vertical bipolar transistor by selectively introducing impurities of the first conductivity type into another island;

covering said epitaxial layer with an oxide layer;

exposing a portion of said lower electrode region by patterning said oxide layer and depositing thereon a dielectric layer of the MIS type capacitor;

further patterning said oxide layer and forming an emitter region of the vertical bipolar transistor by selectively diffusing impurities of the second conductivity type; and

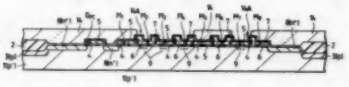
forming an upper electrode of the MIS type capacitor on said dielectric layer and forming electrodes which make ohmic contacts through contact holes provided at desired regions in said oxide layer.

4,898,840

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE AND A METHOD OF PRODUCING THE SAME

Kousuke Okuyama, Kawagoe, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 10, 1988, Ser. No. 269,702
Claims priority, application Japan, Nov. 13, 1987, 62-285318
Int. Cl.[4] H01L *21/00, 21/02, 21/265;* B01J *17/00*
U.S. Cl. 437—41 **12 Claims**



1. A method of producing semiconductor integrated circuit devices, comprising:

(a) a step for introducing impurities into the surface of a semiconductor material having a first type of conductivity, said impurities having a second type of conductivity that is opposite to said first type of conductivity;

(b) a step for forming a plurality of first conductive layers maintaining an equal distance on the surface of said semiconductor material;

(c) a step for forming a plurality of second conductive layers among said plurality of first conductive layers on the surface of said semiconductor material, in such a manner that said second conductive layers are partly overlapped on said first conductive layers;

(d) a step for forming a masking layer having openings at positions corresponding to particular ones of said plurality of first conductive layers or said plurality of second conductive layers; and

(e) a step for selectively introducing impurities of the first conductivity type into the openings utilizing said masking layer;

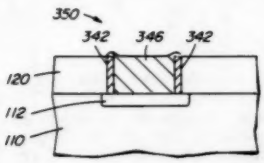
wherein said first and second conductive layers constitute gate electrodes of MISFET's that are connected in series.

4,898,841

METHOD OF FILLING CONTACT HOLES FOR SEMICONDUCTOR DEVICES AND CONTACT STRUCTURES MADE BY THAT METHOD

Vu Q. Ho, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jun. 16, 1988, Ser. No. 207,568
Int. Cl.[4] H01L *21/285*
U.S. Cl. 437—200 **4 Claims**



1. A method of filling a contact hole of a semiconductor device, said contact hole extending through a dielectric isolation layer of the semiconductor device to expose a contact region of the semiconductor device, the exposed contact region defining a bottom of the contact hole and the dielectric isolation layer defining side walls of the contact hole, the method comprising:

forming a layer of metal silicide on the side walls of the contact hole, said metal silicide being a silicide of a metal alloy, the alloy comprising a refractory metal and at least one noble metal; and

selectively depositing metal on the bottom of the contact hole and on the layer of metal silicide on the side walls of the contact hole to substantially fill the contact hole.

4,898,842

ORGANOMETALLIC-DERIVED CORDIERITE AND OTHER COMPOUNDS COMPRISING OXIDES OF SILICON

Lawrence D. David, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 835,498, Mar. 3, 1986, abandoned. This application Sep. 14, 1987, Ser. No. 97,397
Int. Cl.[4] C03C *10/08*
U.S. Cl. 501—9 **33 Claims**

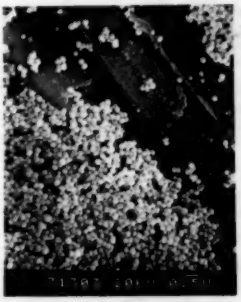
1. A method of producing amorphous powders comprising cordierite-forming glasses, wherein the method comprises: (a) forming an aqueous or organic solution having an aqueous or organic solvent, respectively, and containing at least two precursors of said amorphous powders comprising cordierite, wherein said precursors are β-diketonates of magnesium and aluminum or chelating hydroxycarboxylates of aluminum and magnesium; (b) adding to said solution a silane; (c) adding to said solution a reagent capable of hydrolyzing at least said silane wherein said precursor components, said silane, and said hydrolyzing reagent undergo a polymerization reaction; (d) stripping from said aqueous or organic solution the aqueous or organic solvent, leaving a residue; (e) pyrolyzing said residue to produce a fine, amorphous powder comprised of amorphous cordierite-forming glass.

4,898,843

TITANATE POWDER AND PROCESS FOR PRODUCING THE SAME

Fumio Matushita; Kageyasu Akashi, both of Kawasaki, and Satoshi Sekine, Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 659,704, Oct. 11, 1984, abandoned. This application Feb. 9, 1988, Ser. No. 157,093
Claims priority, application Japan, Oct. 12, 1983, 58-189249; Oct. 26, 1983, 58-199173
Int. Cl.[4] C04B *35/46*
U.S. Cl. 501—136 **12 Claims**



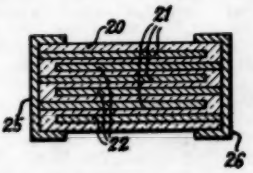
1. A powder consisting of barium titanate powder, strontium titanate powder or a solid solution thereof, wherein (a) the average particle diameter is 0.07 to 0.5μ, (b) the specific surface area measured is 20 m^2/g or less and does not exceed 2.5 times the specific surface area calculated from the average particle diameter on the assumption that the powder particles be spherical, (c) the crystallite size calculated from the half-width of the peak of the X-ray diffraction pattern for the powder is 0.05μ or more, and (d) the particle shape is substantially spherical.

4,898,844

PROCESS FOR MANUFACTURING A CERAMIC BODY HAVING MULTIPLE BARIUM-TITANATE PHASES

Caleb H. Maher, North Adams, and Susan E. Stefanik, Adams, both of Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Jul. 14, 1986, Ser. No. 885,509
Int. Cl.[4] C04B *35/46*
U.S. Cl. 501—138 **8 Claims**



1. A method for making a dielectric ceramic body comprising:

(a) forming a start mixture by mixing a first barium titanate

powder A having a Curie temperature greater than 120° C., a second barium titanate powder B having a Curie temperature less than 0° C., from 1 to 4 weight percent of a glass borate powder C and greater than zero but less than 2½ weight percent of a powdered sintering-inhibitor agent D, said barium titanate A being present in a quantity by weight percent that is about twice that of said barium titanate B;

(b) forming a body of said start mixture; and

(c) sintering said body to produce a dense dielectric ceramic body.

4,898,845

CATALYST DISPERSED IN SUPPORTED MOLTEN SALT

Ravindra Datta, and Darrell P. Eyman, both of Iowa City, Iowa, assignors to University of Iowa Research Foundation, Iowa City, Iowa

Filed Dec. 12, 1988, Ser. No. 283,402

Int. Cl.[4] B01J *23/42, 23/74*

U.S. Cl. 502—3 **12 Claims**

1. A catalytically active composition, comprising:

a porous substrate having a large internal surface area;

a molten salt disposed to coat said surface area with a thin film; and

microcrystallites of a catalytically active metal heterogeneously dispersed in said molten salt.

4,898,846

CRACKING CATALYSTS WITH OCTANE ENHANCEMENT

Grant C. Edwards, Silver Spring, and Alan W. Peters, Rockville, both of Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Mar. 21, 1986, Ser. No. 842,519

Int. Cl.[4] B01J *29/28, 29/08*

U.S. Cl. 502—67 **10 Claims**

1. A catalytic cracking catalyst comprising a primary, large pore high silica zeolite exchanged to a low soda level which is mixed in a matrix, said primary large pore zeolite being present in a catalytically effective amount for catalytic cracking and in an amount up to 80% by weight of the total mixture and where said primary large pore zeolite is not a Y-faujasite nor an X-faujasite.

3. A cracking catalyst according to claim 1, wherein the primary, large pore zeolite is zeolite Beta, ZSM-20, or mixtures thereof.

7. A cracking catalyst according to claim 1, wherein the catalyst further comprises a secondary zeolite in an amount of 1-30% by weight of the catalyst selected from the group consisting of X-faujasite, Y-faujasite, ferrierite, mordenite and mixtures thereof and wherein the amount of the primary, large pore zeolite is equal to or greater than the amount of the secondary zeolite.

4,898,847

CATALYST AND METHOD FOR PRODUCTION OF POLYMERS AND COPOLYMERS OF 1-ALKENES

Zdenek Salajka; Odlrich Hamrik; Jan Kratochvila; Mihnea Gheorghiu; Josef Krivánek, all of Brno; Pavel Sindelár, Prostejov; Petr Zaloudik, Brno; Vasil Legeza, Litvinov, and Ladislav Jansa, Teplice, all of Czechoslovakia, assignors to Vyzkumny Ustav Makromolekularni Chemie, Brno, Czechoslovakia

Continuation-in-part of Ser. No. 38,820, Apr. 15, 1987, abandoned. This application Jul. 1, 1987, Ser. No. 68,998

Claims priority, application Czechoslovakia, Jul. 3, 1986, 5072-86; Aug. 22, 1986, 7089-86; Dec. 23, 1986, 9837-86

Int. Cl.[4] C08F *4/64*

U.S. Cl. 522—110 **13 Claims**

1. A supported one-phase catalyst for polymerizing ethylene and for copolymerizing ethylene with 1-alkenes containing from 3 to 10 carbon atoms prepared by the process comprising the combination of the following steps conducted in the recited order:

(I) first depositing under an inert atmosphere and fixing on a particulate support containing OH groups and formed of an oxide selected from the group consisting of silica and alumina, said support having a surface area in the range of 50 to 500 m^2/g, an inner porosity in the range of 0.5 to 3.0 ml/g and particulate dimensions in the range of 1 to 200 microns; at least one organoaluminum compound having the empirical formula I:

$$R_mAlX_{3-m}$$

wherein m is an integer ranging from 1 to 3;

(II) then depositing at least one transition metal compound (I) of the group of titanium compounds having empirical formula IIa:

$$R_nTiX_{4-n} \quad \text{(IIa)}$$

wherein n is an integer ranging from 0 to 4; or vandium having the emprical formula IIb:

$$R_pVX_{5-p} \text{ or } R_qVX4\text{-}q \quad \text{(IIb)}$$

wherein p is an integer ranging from 0 to 5 and q is an integer ranging from 0 to 4; and, finally depositing on the thus coated substrate at least one organometallic compound having the empirical formula IIIa wherein said compounds are organoaluminum compounds of formula I or organomagnesium compounds of formula IIIb:

$$R_rMgX_{2-r} \quad \text{(IIIb)}$$

wherein r is an integer ranging from 1 to 2, with the proviso that all said compounds of formulas I, II and III have substituents R being selected from those groups of substituents consisting of alkyl, aryl and alkoxide having from 1 to 20 carbon atoms; with X being halogen except that in compounds of formula II, X_2 can be oxygen and substituents R and X in compounds of formulas I, II, and III can be the same or different; said catalyst not requiring additional activation.

4,898,848

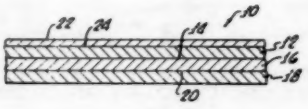
THERMAL LABEL WITH REMOISTENABLE ADHESIVE

Tomoo Shibata, Irvine, Calif., assignor to Ricoh Electronics, Inc., Irvine, Calif.

Continuation of Ser. No. 929,342, Nov. 12, 1986, abandoned. This application Jun. 20, 1988, Ser. No. 208,669

Int. Cl.[4] B41M *5/18*

U.S. Cl. 503—200 **8 Claims**



1. A thermosensitive label comprising:

a substrate;

thermosensitive color-forming layer means, disposed on one side of said substrate, for creating a display of images when the temperature of selected portions of the thermosensitive color-forming layer means are heated above an activation temperature; and

a remoistenable adhesive disposed on an opposite side of said substrate, said remoistenable adhesive being disposed on said substrate in a viscous form and dried on the substrate without heating the thermosensitive color-forming layer above the activation temperature, said remoistenable adhesive comprising components not causing color formation or fading of images created in the thermosensitive

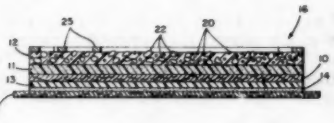
color-forming layer, said remoistenable adhesive comprising a water-soluble or water dispersible casein-vinyl acetate having a solids content of at least about 70 percent by weight when applied to the opposite side of the substrate.

4,898,849

COATED THERMALLY PRINTABLE MATERIAL AND METHOD OF PRODUCING THE SAME

Ming-Huang J. Kang, Nashua, N.H., assignor to Nashua Corporation, Nashua, N.H.

Filed Dec. 29, 1987, Ser. No. 139,186
Int. Cl.[4] B41M *5/18*
U.S. Cl. 503—214 **11 Claims**



1. A heat-sensitive recording material comprising:

A. a substrate;

B. a thermal imagewise imprintable color-producing layer affixed to a first surface of said substrate comprising a leuco dye developable upon exposure to an acidic developer, an acidic developer, and a binder material for said dye and developer; and

C. a protective layer overlying said color-producing layer, wherein said protective layer comprises;

an organic water soluble resin cross-linked during its formation in situ atop said color-producing layer and containing dispersed friction reducing polymer particles and a fluorocarbon surfactant,

said material being characterized by decreased surface friction and resistance to background discoloration and image fading induced by exposure to solvents.

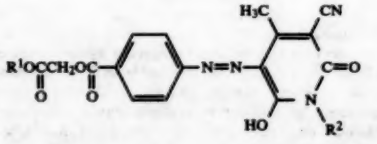
4,898,850

PYRIDONE DYESTUFF FOR THERMAL TRANSFER RECORDING AND PRINTING SHEETS AND METHODS EMPLOYING SAME

Akitosi Igata, and Tamio Mikoda, both of Omuta, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Dec. 2, 1988, Ser. No. 278,857
Claims priority, application Japan, Dec. 3, 1987, 62-304601; Oct. 18, 1988, 63-260653
Int. Cl.[4] B41M *5/035, 5/26*
U.S. Cl. 503—227 **25 Claims**

1. In a gas phase thermal transfer printing method in which a volatilizable dyestuff in the form of a heat-releasable coating on a surface of a transfer substrate is pressed against a face of a printable substrate, while the transfer substrate is heated to the volatilization temperature of the dyestuff, thereby transferring the pattern of the dyestuff from the transfer substrate to the printable substrate, the improvement wherein the dyestuff is a yellow pyridone of the formula



wherein R^1 is lower alkyl and R^2 is lower alkyl, lower alkoxy-lower alkyl, carbocyclic aryl-lower alkyl, cyclo-lower alkyl, lower alkenyl or lower alkoxycarbonyl-methyl.

4,898,851

PROCESS FOR MAKING 90 K SUPERCONDUCTORS USING A SPRAY DRIED OXALATE PRECURSOR

John B. Michel, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 22, 1987, Ser. No. 64,951
Int. Cl.[4] C01F *17/00*; C01G *3/02*; C04B *35/64*; H01L *39/12*
U.S. Cl. 505—1 **12 Claims**

1. An improved process for preparing a superconducting composition having the formula $MBa_2Cu_3O_x$ wherein

M is selected from the group consisting of Y, Nd, Sm, Eu, Gd, Dy, Ho, Er, Tm, Yb and Lu;

x is from about 6.5 to about 7.0;

said composition having a superconducting transition temperature of about 90K;

said process consisting essentially of heating a precursor powder in an oxygen-containing atmosphere at a temperature from about 875° C. to about 950° C. for a time sufficient to form $MBa_2Cu_3O_y$, where y is from about 6.0 to about 6.4; and maintaining the $MBa_2Cu_3O_y$ in an oxygen-containing atmosphere while cooling for a time sufficient to obtain the desired product;

said precursor powder being prepared by

(a) forming an aqueous solution of $M(NO_3)_3$, $Ba(NO_3)_2$ and $Cu(NO_3)_2$ in an atomic ratio of M:Ba:Cu of about 1:2:3, (b) adding the resulting solution to sufficient oxalic acid to precipitate the metals present as salts, and (c) spray drying the resulting slurry to obtain the precursor powder.

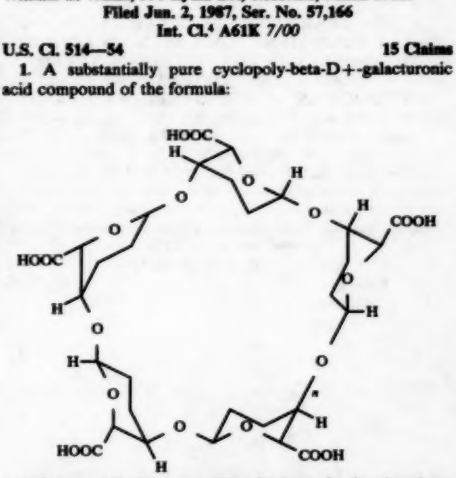
4,898,852

CYCLOPOLGALCTURONIC ACID COMPOSITION AND TREATMENT

William E. Walsh, 990 Lydia Dr., Roseville, Minn. 55113

Filed Jun. 2, 1987, Ser. No. 57,166
Int. Cl.[4] A61K *7/00*
U.S. Cl. 514—54 **15 Claims**

1. A substantially pure cyclopoly-beta-D+-galacturonic acid compound of the formula:



and pharmaceutically acceptable salts thereof, wherein n is an integer of 1 to 10.

2. A viscous liquid topical application comprising a major proportion of a pharmaceutically acceptable liquid base and about 0.1 to 10 wt-% of the cyclogalacturonic acid compound of claim 1.

4,898,853

ACETYLENIC ESTERS

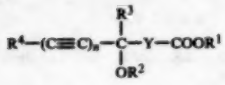
James V. Heck, Scotch Plains, and Michael D. Lewis, Rahway, both of N.J., assignors to Merck & Co. Inc., Rahway, N.J.

Continuation of Ser. No. 156,106, Feb. 16, 1988, abandoned. This application Aug. 1, 1989, Ser. No. 388,717

Int. Cl.[4] A61K *31/695*; C07F *7/18*

U.S. Cl. 514—63 **11 Claims**

1. A compound of the formula:



wherein R^1 is:
(a) hydrogen:
(b) C_1–C_6 alkyl;
(c) C_7–C_{14} aralkyl;
(d) tris (C_1–C_5 alkyl)silyl; or
(e) a pharmaceutically acceptable cation;
R^2 is:
(a) hydrogen;
(b) C_1–C_6 alkyl;
(c) C_7–C_{14} aralkyl ;
(d) tris (C_1–C_6 alkyl)silyl;
(e) C_2–C_6 alkanoyl;
(f) C_2–C_7 alkoxycarbonyl; or
R^3 is:
(a) hydrogen; or
(b) C_1–C_6 alkyl;
R^4 is
tris(C_1–C_6 alkyl)silyl;
Y is:
C_4–C_{10} alkylene or C_4–C_{10} alkylene substituted with one or more substituents selected from the group comprising:
(i) hydroxy;
(ii) C_2–C_6 alkanoyloxy; and
(iii) C_2–C_7 alkoxycarbonyloxy; and
n is an integer of from about 1 to 4.

4,898,854

CERTAIN 2-CARBOXYPIPERIDYL-(ALKYLENE OR ALKENYLENE)-PHOSPHONIC ACIDS AND ESTERS THEREOF USEFUL FOR THE TREATMENT OF DISORDERS RESPONSIVE TO N-METHYL-D-ASPARTATE RECEPTOR BLOCKADE

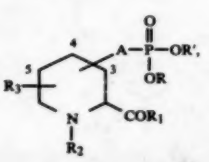
Alan J. Hutchison, Verona; Kenneth R. Shaw, and Josef A. Schneider, both of Millburn, all of N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 933,702, Nov. 21, 1986, abandoned, which is a continuation-in-part of Ser. No. 867,114, May 27, 1986, abandoned, which is a continuation-in-part of Ser. No. 738,102, May 24, 1985, abandoned. This application Jul. 11, 1988, Ser. No. 217,120

Int. Cl.[4] C07F *9/65*; A61K *33/42*

U.S. Cl. 514—89 **26 Claims**

1. A compound of the formula



(II)

in which the phosphono bearing chain is attached at the 3, 4, or 5-position of the piperidinyl ring and wherein R and R′ represent hydrogen, lower alkyl, benzyl, benzyl substituted on phenyl by halogen, lower alkyl or lower alkoxy, lower alkanoyloxymethyl or lower alkanoyloxymethyl substituted on oxymethyl by lower alkyl, cyclohexy or cyclopentyl; R_2 represents hydrogen, lower alkyl or acyl; R_3 represents hydrogen, lower alkyl or aryl-lower alkyl; COR_1 represents carboxy or carboxy derivatives in the form of a pharmaceutically acceptable prodrug ester; A represents lower alkenylene or lower alkylene; acyl in the above definitions represents lower alkanoyl, aryl-lower alkanoyl, aroyl, lower alkoxycarbonyl, aryl-lower alkoxycarbonyl; or alpha-amino lower alkanoyl aryl represents phenyl or phenyl substituted by one to three substituents selected from lower alkyl, lower alkoxy, trifluoromethyl and halogen; aroyl represents benzoyl or benzoyl substituted by one to three substituents selected from lower alkyl, lower alkoxy, trifluoromethyl and halogen; or a pharmaceutically acceptable salt of a said compound having an acidic or basic salt forming group.

16. A method of blocking the N-methyl-D-aspartate excitatory amino acid receptor in a mammal comprising the administration to a mammal in need thereof of an effective N-methyl-D-aspartate blocking amount of a compound of claim 1 in combination with one or more pharmaceutically acceptable carriers.

4,898,855

DEUTERATED ANALOGS OF 1,25-DIHYDROXYCHOLECALCIFEROL

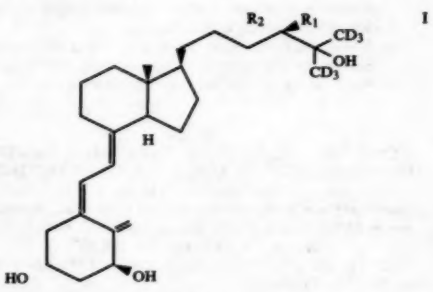
Enrico G. Baggiolini, North Caldwell; Bernard M. Hennessy, Nutley, and Milan R. Uskokovic, Upper Montclair, all of N.J., assignors to Hoffman-La Roche Inc., Nutley, N.J.

Filed Sep. 14, 1987, Ser. No. 96,981

Int. Cl.[4] A61K *31/59*; C07J *9/00*

U.S. Cl. 514—167 **16 Claims**

1. A compound of the formula



I

wherein R_1 and R_2 are deuterium.

4,898,856

METHOD FOR TREATING CENTRAL NERVOUS SYSTEM DISEASES

Chaovanee Aroonsakul, 6907 S. Constance, Chicago, Ill. 60649

Continuation-in-part of Ser. No. 666,254, Oct. 29, 1984, Pat. No. 4,791,099, and a continuation-in-part of Ser. No. 852,645, Apr. 16, 1986, Pat. No. 4,727,041. This application Feb. 16, 1988, Ser. No. 156,242

Int. Cl.[4] A61K *31/56*

U.S. Cl. 514—171 **2 Claims**

1. A method for treating central nervous system diseases in human beings, said diseases are selected from Senile Dementia, Parkinson's disease, cerebral atrophy, Alzheimer's disease, cerebellar atrophy, senile tremor, and essential tremor, multiple schlerosis, cerebrovascularr accidents, said method comprising:

inducing into the blood stream of the human being suffering from one of said diseases, an effective amount of human growth hormone.

4,898,857

TREATING CONTROL NERVOUS SYSTEM DISEASES

Chaovanee Aroonsakul, 6907 S. Constance, Chicago, Ill. 60649

Continuation of Ser. No. 156,242, Feb. 16, 1988, which is a continuation-in-part of Ser. No. 666,254, Oct. 29, 1984, Pat. No. 4,791,099, and Ser. No. 852,645, Apr. 16, 1986, Pat. No. 4,727,041. This application Feb. 3, 1989, Ser. No. 293,132

Int. Cl.[4] A61K *31/56*

U.S. Cl. 514—171 3 Claims

1. A method for treating central nervous system diseases in human beings, which diseases are selected from Senile Dementia, Parkinson's disease, cerebral atrophy, Alzheimer's disease, cerebellar atrophy, senile tremor, and essential tremor, comprising:

inducing into the blood stream of of a human being suffering from the disease an effective dosage of a group consisting of: androgens.

4,898,858

CEPHALOSPORIN DERIVATIVES AND ANTIBIOTICS CONTAINING THE SAME

Seiji Shibahara, Tokyo; Tsuneo Okonogi, Kanagawa; Yasushi Murai, Kanagawa; Toshiaki Kudo, Kanagawa; Takashi Yoshida, Tokyo; Ken Nishihata, Kanagawa, and Shinichi Kondo, Kanagawa, all of Japan, assignors to Meiji Seika Kaisha Ltd. and Susumu Mitsuhashi, both of Tokyo, Japan

Filed Nov. 10, 1986, Ser. No. 928,955

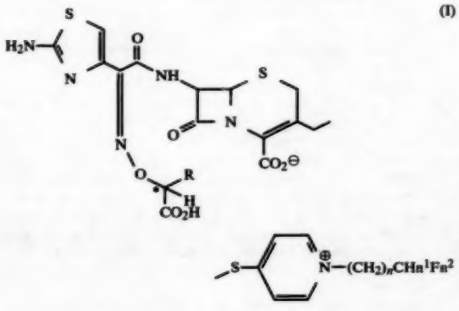
Claims priority, application Japan, Nov. 27, 1985, 60-267984

The portion of the term of this patent subsequent to Mar. 7, 2006, has been disclaimed.

Int. Cl.[4] C07D *501/136;* A61K *31/545*

U.S. Cl. 514—206 14 Claims

1. Cephalosporin derivatives of a general formula (I) and non-toxic salts and non-toxic esters thereof:



(I)

(wherein R represents an acyclic or cyclic lower alkyl group having up to 6 carbon atoms, which may optionally be substituted by a halogen atom; the steric configuration as asterisked (*) includes an optical-active (R)-form or (S)-form or an optical-inactive (RS)-form; n is 0 or 1, n^1 is 0 to 3, n^2 is 0 to 3; and when n^1 is 0, n^2 is 3; when n^1 is 1, n^2 is 2; when n^1 is 2, n^2 is 1: when n^1 is 3, n^2 is 0).

4,898,859

2-OXA-ISOCEPHEM COMPOUNDS AND COMPOSITIONS CONTAINING SAME

Setsuro Fujii, Kyoto; Hiroshi Ishikawa; Koichi Yasumura, both of Otsu; Koichiro Jitsukawa, Ashiya; Sachio Toyama, Otsu; Hidetsugu Tsubouchi, Otsu; Kimio Sudo, Otsu, and Kouichi Tsuji, Otsu, all of Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Mar. 9, 1988, Ser. No. 165,942

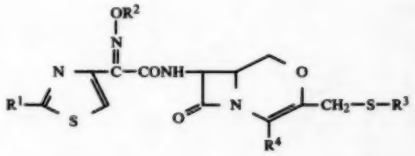
Claims priority, application Japan, Mar. 9, 1987, 62-53870; Jul. 14, 1987, 62-175045; Sep. 3, 1987, 62-221043; Jan. 28, 1988, 63-18350

The portion of the term of this patent subsequent to May 26, 2006, has been disclaimed.

Int. Cl.[4] A61K *31/535;* C07D *498/04*

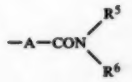
U.S. Cl. 514—210 29 Claims

1. A 2-oxa-isocephem compound of the formula (1):



(I)

wherein R^1 is an amino group, a lower alkanoylamino group, a halogen-substituted lower alkanoylamino group, a phenylsubstituted lower alkylamino group having 1 to 3 phenyl groups, a phenyl-lower alkoxycarbonylamino group or a lower alkoxycarbonylamino group; R^2 is a lower alkyl group, a cycloalkyl group, a cyano-lower alkyl group, a carboxy-lower alkyl group or a carbamoyl-lower alkyl group; R^3 is a pyridyl group or a pyridinio group, in which the pyridinio group is substituted with a lower alkyl group, a cycloalkyl-lower alkyl group, a lower alkoxy-lower alkyl group, a lower alkanoyl-lower alkyl group, a benzoyl-lower alkyl group, a halogen-substituted lower alkyl group, a lower alkyl group substituted with a halogen-substituted lower alkanoyl group, a carboxycarbonyl-lower alkyl group, a lower alkyl group or a lower alkyl group substituted with a lower alkoxyimino group, or a group of the formula:



in which A is a lower alkylene group, R^5 is a hydrogen atom or a lower alkyl group, R^6 is a lower alkyl group or a hydroxy group, and R^5 and R^6 together with the adjacent nitrogen atom may form a saturated 5- or 6-membered heterocyclic group which may contain further an oxygen atom, a nitrogen atom and/or a sulfur atom, and further said heterocyclic group may be substituted with a hydroxy group or a lower alkyl group; and R^4 is a carboxy group, a carboxylate group or an esterified carboxy group, provided that R^2 is a carbamoyl-lower alkyl group, when R^3 is a pyridyl group, or a pyridinio group substituted with a lower alkyl group, or its pharmaceutically acceptable salt.

29. An antimicrobial composition comprising an antimicrobially effective amount of 2-oxa-isocephem compound of the formula (1) as defined in claim 1 or its pharmaceutically acceptable salt, and a pharmaceutically acceptable carrier.

4,898,860

ANTICONVULSANT COMPOSITION AND METHOD

Jose M. Musacchio, New York, N.Y., and Frank C. Tortella, Columbia, Md., assignors to New York University, New York, N.Y.

Continuation-in-part of Ser. No. 897,410, Aug. 18, 1986, abandoned, which is a continuation-in-part of Ser. No. 766,838, Aug. 16, 1985, Pat. No. 4,694,010. This application Mar. 28, 1988, Ser. No. 174,175

Int. Cl.[4] A61K *31/44, 31/55, 31/415*

U.S. Cl. 514—215 15 Claims

10. A method for controlling seizures in a mammal in need of such treatment comprising administering to said mammal an amount of

(a) an anti-epileptic hydantoin; and

(b) an anti-epileptic hydantoin-potentiating amount of a compound selected from the group consisting of benztropine and opipramol; said amounts in combination being effective for controlling seizures in said mammal.

4,898,861

METHOD FOR INHIBITING THE PROLIFERATION OF TUMOR CELLS

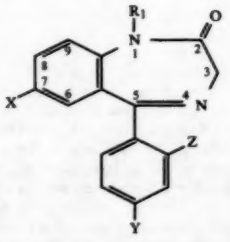
James I. Morgan, Upper Montclair; Sydney Spector, Livingston, both of N.J., and James K. T. Wang, New York City, N.Y., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 30,932, Mar. 26, 1987, abandoned, which is a continuation of Ser. No. 655,653, Sep. 28, 1984, abandoned, which is a continuation-in-part of Ser. No. 524,169, Aug. 17, 1983, abandoned. This application Aug. 29, 1988, Ser. No. 237,649

Int. Cl.[4] A61K *31/55*

U.S. Cl. 514—221 8 Claims

1. A method for treating a patient afflicted with tumor cells having specific, saturable peripheral binding sites which comprises orally administering to the patient a benzodiazepine having a selective affinity to bind to the peripheral binding sites on the tumor cells, which cells are sensitive to treatment with the benzodiazepine, said benzodiazepine having the formula



wherein R_1 is C_1 to C_3 alkyl, C_2 to C_3 alkenyl or C_2 to C_3 alkynyl; Y is halogen, hydroxy or lower alkoxy; X is halogen and Z is halogen or hydrogen, in a daily dose between about 10 mg/kg of body weight of the patient and about 50 mg/kg of body weight of the patient which is effective for inhibiting the proliferation of said tumors cells.

4,898,862

1,2,4-TRIAZINONE DERIVATIVES, THEIR PREPARATION AND USE

Yasuhiro Morisawa; Mitsuru Kataoka; Mitsuo Sugiyama; Fujio Saito; Hiroyuki Koike; Takeshi Oshima; Yasuo Simoji, and Hitoshi Nagahori, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

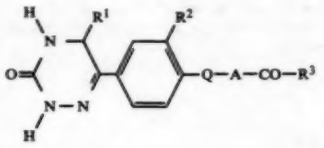
Filed Mar. 16, 1987, Ser. No. 26,290

Claims priority, application Japan, Mar. 20, 1986, 61-62593; Apr. 2, 1986, 61-75996; Apr. 14, 1986, 61-85255

Int. Cl.[4] C07D *253/06, 401/12, 403/12;* A61K *31/53*

U.S. Cl. 514—236.2 23 Claims

1. A compound of formula (I):



(I)

wherein:

R^1 represents a hydrogen atom or a C_1–C_6 alkyl group; R^2 represents a hydrogen atom, a halogen atom, a C_1–C_6 alkyl group, a substituted C_1–C_6 alkyl group having at least one halogen atom, a nitro group, an amino group, a protected amino group, an alkylamino group in which the alkyl part is C_1–C_6, a dialkylamino group in which each alkyl part is C_1–C_6, a cyano group, a carbamoyl group, an alkylcarbamoyl group in which the alkyl part is C_1–C_6, a dialkylcarbamoyl group in which each alkyl part is C_1–C_6, a ureido group, an alkylureido group in which the alkyl part is C_1–C_6, a dialkylureido group in which each alkyl part is C_1–C_6, a carboxy group or a protected carboxyl group;

Q represents an oxygen atom or a sulfur atom;

A represents a C_1–C_6 alkylene group;

R^3 represents a hydroxy group, a C_1–C_6 alkoxy group, an aryloxy group, an aralkyloxy group in which the alkyl part has from 1 to 6 carbon atoms or a group of formula $-(NH)_n-NR^5R^6$, wherein

n is 0 or 1; and

R^5 and R^6 are independently selected from the group consisting of hydrogen atoms; C_1–C_{10} alkyl groups; C_2–C_6 alkenyl groups; C_3–C_7 cycloalkyl groups; aryl groups; heterocyclic groups, and substituted C_1–C_{10} alkyl groups having at least one substituent selected from the group consisting of substituent (a) defined below; or R^5 and R^6, together with the nitrogen atom to which they are attached, form a heterocyclic group as defined below;

substituents (a):

halogen atoms, hydroxy groups, C_1–C_6 alkoxy groups, aryloxy groups, aralkyloxy groups in which the alkyl part has from 1 to 6 carbon atoms, carboxy groups, protected carboxy groups, carbamoyl groups, alkylcarbamoyl groups in which the alkyl part is C_1–C_6 dialkylcarbamoyl groups in which each alkyl part is C_1–C_6, C_3–C_7 cycloalkyl groups, aryl groups, heterocyclic groups, amino groups, protected amino groups and substituted amino groups having one or two substituents selected from the group consisting of C_1–C_6 alkyl groups, aryl groups and heterocyclic groups;

said protected amino group is an amino group protected with a group selected from the group consisting of C_1–C_7 aliphatic carboxylic acyl groups; substituted C_1–C_7 aliphatic carboxyl acyl groups having at least halogen or C_1–C_4 alkoxy groups; arylcarbonyl groups; aralkyloxy carbonyl groups in which the alkyl part is C_1–C_6; and aralkyl groups in which the alkyl part is C_1–C_6;

said protected carboxy group is a carboxy group protected with a group selected from the group consisting of C_1–C_6

alkyl groups, aralkyl groups in which the alkyl part is a C_1–C_6 alkyl, C_2–C_3 aliphatic acyloxymethyl groups, 1-(C_2–C_7 alkoxycarbonyloxy)ethyl groups, phthalidyl group (2-oxo-5-methyl-1,3-dioxolen-4-yl)methyl group, (2-oxo-5-phenyl-1,3-dioxolen-4-yl)methyl group, C_1–C_6 alkoxymethyl groups and halogenated C_1–C_6 alkyl groups;

said aryl groups and aryl parts of groups containing an aryl are phenyl or naphthyl groups which are unsubstituted or have at least one substituent selected from the group consisting of halogen atoms, hydroxy group, C_1–C_6 alkoxy groups, C_1–C_6 alkyl groups, halogenated C_1–C_6 alkyl groups, nitro groups, sulfamoyl groups and C_1–C_6 alkylsulfamoyl groups;

said heterocyclic groups and heterocyclic parts of groups containing a heterocyclic group are groups selected from the group consisting of tetrahydrofuryl, tetrahydropyranyl, tetrahydrothienyl, tetrahydrothiopyranyl, aziridinyl, azetidinyl, pyrrolidinyl, piperidyl, hexahydroazepinyl, imidazolidinyl, oxazolidinyl, thiazolidinyl, morpholinyl, thiomorpholinyl, piperazinyl, homopiperazinyl, furyl, thienyl, pyrrolyl, pyridyl, oxazolyl, thiazolyl and pyrimidinyl groups which are unsubstituted or have at least one substituent selected from the group consisting of substituent (b):

substituent (b): phenyl groups; naphthyl groups; substituted phenyl or naphthyl groups having at least one substituent selected from the group consisting of halogen atoms, C_1–C_4 ethyl groups, C_1–C_4 alkoxy groups and trifluoromethyl groups; C_1–C_4 alkyl groups; substituted C_1–C_4 alkyl groups having at least one substituent selected from the group consisting of hydroxyl groups, phenyl groups and substituted phenyl groups having at least one substituent selected from the group consisting of halogen atoms, C_1–C_4 alkyl groups, C_1–C_4 alkoxy groups and trifluoromethyl groups; C_1–C_7 alkanoyl groups; substituted C_2–C_7 alkanoyl groups having at least one substituent selected from the group consisting of furyl groups, thienyl groups, pyridyl groups, C_3–C_7 cycloalkyl groups, halogen atoms, C_1–C_4 alkoxy groups and phenyl groups; C_2–C_5 Alkoxycarbonyl groups; aralkyloxycarbonyl groups wherein the alkyl part is C_1–C_4 and the aryl part is phenyl or naphthyl groups or substituted phenyl or naphthyl groups having at least one substituent selected from the group consisting of halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy and trifluoromethyl groups; benzoyl groups; naphthoyl groups; substituted benzoyl or naphthoyl groups having at least one substituent selected from the group consisting of halogen atoms, sulfamoyl groups, C_1–C_4 alkyl groups and C_1–C_4 alkoxy groups; furyl carbonyl groups; thienyl carbonyl groups; pyridylcarbonyl groups; C_1–C_4 alkylsulfonyl groups; arylsulfonyl groups, wherein the aryl part is phenyl or naphthyl groups, or substituted phenyl or naphthyl groups having at least one substituent selected from the group consisting of halogen atoms, C_1–C_4 alkyl groups, C_1–C_4 alkoxy groups and trifluoromethyl groups; the carbamoyl group; mono- and di- alkylcarbamoyl groups wherein the alkyl part is C_1–C_4; furyl groups; thienyl groups; pyridyl groups and oxygen atoms;

or a pharmaceutically acceptable acid addition salt thereof; and providing that:

when R^2 represents said hydrogen atom or said nitro, amino or cyano group, then R^3 represents a group of formula $-(NH)_n-NHR^6$, where n is 0 or 1 and R^6 represents said C_1–C_6 alkyl group having at least one heterocyclic substituent.

20. A method of treating cardiac disorders in an animal comprising administering to said animal, a cardiotonically effective amount of the compound of claim **1**.

4,898,863

HETEROCYCLIC CARBOXAMIDES

Frederick J. Brown, Newark, Del., and Ying K. Yee, Kennett Square, Pa., assignors to ICI Americas Inc., Wilmington, Del.

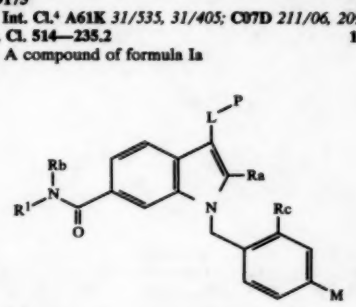
Filed Apr. 15, 1987, Ser. No. 38,842

Claims priority, application United Kingdom, Apr. 15, 1986, 8609175

Int. Cl.[4] **A61K** *31/535, 31/405;* **C07D** *211/06, 209/14*

U.S. Cl. 514—235.2 **14 Claims**

1. A compound of formula Ia



Ia

wherein

Ra is hydrogen or (1–4C)alkyl;

Rb is hydrogen or methyl;

R^1 is (2–10C)alkyl which may contain 1 or more fluorine substituents; or R^1 is phenyl-(1–6C)alkyl in which the (1–6C)alkyl moiety may bear a fluoro or (1–4C)alkoxy substituent and in which the phenyl moiety may bear a substituent selected from a group consisting of halogeno, (1–4C)alkyl, (1–4C)alkoxy and trifluoromethyl; or R^1 is (3–8C)cycloalkyl or (3–8C)cycloalkyl-(1–6C)alkyl, the cyclic moiety of any of which may contain one unstruated linkage and may bear 1 or 2 (1–4C)alkyl substituents;

L is a (1–10C)alkylene link, which may contain one double or triple bond;

P is a polar group selected from a group consisting of cyano, 1H-tetrazol-5-yl, carbamoyl of formula $CONR^2R^3$, ureido of formula $NR^4CONR^2R^3$, carbamoyloxy of formula $OCONR^2R^3$, a carbamate of formula NR^4COOR^5, acylamino of formula NR^4COR^5, acyloxy of a formula $OCOR^5$, and a thio group (which may be oxidized) of formula $S(O)_nR^5$ in which

R^2 is selected from a group consisting of hydrogen, (1–6C)alkyl, and phenyl, the phenyl moiety of which may bear 1 or 2 substituents selected from a group consisting of halogeno, (1–4C)alkyl, (1–4C)alkoxy and trifluoromethyl, and

R^3 and R^4 are independently selected from a group consisting of hydrogen and (1–6C)alkyl;

or R^2 and R^3 together with the adjacent nitrogen form a pyrrole, pyrrolidine, piperidine, morpholine, piperazine or N-(1–6C)alkylpiperazine ring, and R^4 is hydrogen or (1–6C)alkyl;

R^5 is chosen from a group consisting of (1–4C)alkyl and phenyl, the phenyl moiety of which may bear 1 or 2 substituents selected form a group consisting of halogeno, (1–4C)alkyl, (1–4C)alkoxy and trifluoromethyl; and

n is the integer 0, 1 or 2;

Rc is selected from a group consisting of hydrogen and (1–4C)alkoxy; and

M is an acidic group selected from a group consisting of carboxy, an acylsulphonamide residue of formula $-CO.NH.SO_2R^6$ and 1H-tetrazol-5-yl in which

R^6 is selected from a group consisting of (1–6C)alkyl, (3–8C-)cycloalkyl, (6–12C)aryl, heteroaryl selected from a group consisting of furyl, thienyl and pyridyl, and (6–12C)aryl(-1–4C)alkyl, in which any of the aromatic or heteroaromatic moieties may bear 1 or 2 substituents selected from a group consisting of halogeno, (1–4C)alkyl, (1–4C)alkoxy, and trifluoromethyl;

or a pharmaceutically acceptable salt thereof.

11. A pharmaceutical composition comprising a leukotriene antagonizing amount of a compound of claim 1 or a pharmaceutically acceptable salt thereof and a pharmaceutically acceptable diluent or carrier.

4,898,864

BICYCLIC AROMATIC COMPOUNDS, A PROCESS FOR THEIR PREPARATION AND THEIR USE IN COSMETICS AND HUMAN AND VETERINARY MEDICINE

Jean Maignan, Tremblay les Gonesse; Gerard Lang, Saint Gratien; Gérard Malle, Villiers sur Morin, and Philippe Vingler, Gif-sur-Yvette, all of France, assignors to L'Oreal, Paris, France

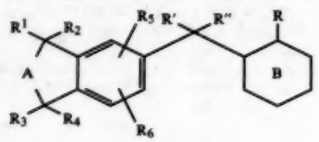
Filed Oct. 27, 1987, Ser. No. 112,860

Claims priority, application France, Oct. 27, 1986, 86 14901

Int. Cl.[4] C07C *59/76*

U.S. Cl. 514—237.5 **15 Claims**

1. A bicyclic aromatic compound having the formula



(R)

wherein

R_1, R_2, R_3 and R_4 each independently represent hydrogen or lower alkyl, at least two of the R_1–R_4 radicals being other than hydrogen,

A represents methylene or dimethylene, substituted or not by lower alkyl; when A represents dimethylene, R_1 and R_3 together can form a methylene or dimethylene radical,

R_5 and R_6 represent hydrogen, halogen, lower alkyl, lower alkoxy or hydroxy,

R′ and R″ together form an oxo radical,

B represents cyclohexyl, cyclohexenyl, cyclohexadienyl or phenyl, substituted or not,

R represents $—CH_2OH$ or $—COR_7$,

R_7 represents hydrogen, $—OR_8$ or

R_8 represents hydrogen, alkyl having 1–20 carbon atoms, monohydroxyalkyl, polyhydroxyalkyl or aryl or aralkyl,

r′ and r″ represent hydrogen, lower alkyl, monohydroxyalkyl optionally interrupted by a heteroatom polyhydroxyalkyl, aryl or benzyl or the residue of amino acid, or r′ and r″ taken together form a heterocycle, and

the salts of said compounds of formula I, their optical isomers and the tautomeric forms of the compound of formula I with the exception of 2-((5,8-methano-5,6,7,8-tetrahydro-2-naphthyl) carbonyl) benzoic acid.

4,898,865

[4-(6-OXO-1,4,5,6-TETRAHYDRO-3-PYRIDAZINYL) ANILINO HEXYL 1,4-DIHYDRO-2,6 DI METHYL 5 NITRO 4 ARYL PYRIDINE 3-CARBOXYLATES

Gerhard Franckowiak; Martin Bechem, both of Wuppertal; Michael Kayser, Leverkusen; Rainer Gross, Wuppertal; Matthias Schramm, Cologne; Friedel Seuter; Elisabeth Perzborn, both of Wuppertal, all of Fed. Rep. of Germany, and Günther Thomas, Arese, Italy, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

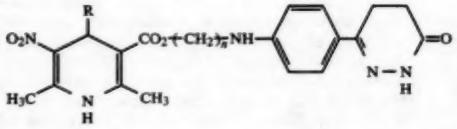
Filed Jul. 13, 1988, Ser. No. 218,759

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1987, 3724909

Int. Cl.[4] A61K *31/495*; C07D *403/14*

U.S. Cl. 514—252 **10 Claims**

1. A nitrodihydropyridine of the formula



in which

R represents phenyl or naphthyl, each of which can be substituted up to 3 times, identically or differently, by fluorine, chlorine, bromine, nitro, cyano, alkyl, alkoxy, alkylthio, each having up to 4 carbon atoms, trifluoromethyl, trifluoromethoxy or trifluoromethylthio, or benzyloxy or benzylthio, each of which is optionally substituted by nitro, fluorine, chlorine, bromine, trifluoromethyl, methyl or methoxy, or represents a heterocycle which is optionally substituted by methyl, fluorine, chlorine, bromine or phenyl and is from the group consisting of thienyl, furyl, pyridyl, pyrimidyl, quinolyl, benzoxadiazolyl or thiochromenyl, and

n represents a number from 1 to 10,

or a physiologically acceptable salt thereof.

4,898,866

THIENYLPIPERAZINONES, THEIR PREPARATION AND THEIR USE

Karl Schönafinger, Alzenau; Rudi Beyerle, Frankfurt, and Ursula Schindler, Mörfelden-Walldorf, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

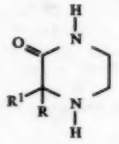
Filed May 9, 1989, Ser. No. 349,540

Claims priority, application Fed. Rep. of Germany, May 20, 1988, 3817198

Int. Cl.[4] A61K *31/495*; C07D *403/04*

U.S. Cl. 514—252 **10 Claims**

1. 3-(Thien-2-yl)-piperazin-2-ones, substituted in the 3-position, of the general formula



(I)

wherein R denotes phenyl; phenyl which is monosubstituted, disubstituted or trisubstituted by $(C_1–C_6)$-alkyl, $(C_1–C_6)$-alkoxy and/or $(C_1–C_6)$-alkoxy-$(C_1–C_6)$-alkyl; $(C_1–C_6)$-alkyl; phenyl-$(C_1–C_6)$-alkyl; naphthyl-$(C_1–C_6)$-alkyl; $(C_1–C_6)$-alkoxy-$(C_1–C_6)$-alkyl; or di-$(C_1–C_6)$-alkylamino-$(C_1–C_6)$-alkyl and R^1 denotes 2-thienyl, and pharmacologically tolerable acid addition compounds thereof.

9. Method for improving the human brain function and/or for reducing the consequences of cerebral aging process in humans which comprises administering to a patient in need of such action an effective amount of a compound of claim 1.

4,898,867

THIENOPYRIMIDINE DERIVATIES AS ALDOSE-REDUCTASE INHIBITORS

Ogawa Kazuo, Tokushima; Yamawaki Ichiro; Matsushita Yoichi, both of Tokushima; Nomura Naruo, Naruto, and Okazaki Issei, Tokushima, all of Japan, assignors to Taiho Pharmaceutical Company, Limited, Tokyo, Japan

PCT No. PCT/JP88/00935, § 371 Date May 4, 1989, § 102(e) Date May 4, 1989, PCT Pub. No. WO89/02432, PCT Pub. Date Mar. 23, 1989

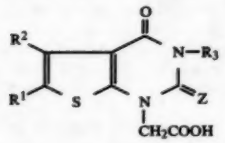
PCT Filed Sep. 16, 1988, Ser. No. 377,862

Claims priority, application Japan, Sep. 16, 1987, 62-231425

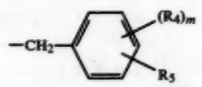
Int. Cl.[4] A61K *31/505;* **C07D** *239/00, 491/00*

U.S. Cl. 514—258 **5 Claims**

1. A thienopyrimidine derivative of the formula

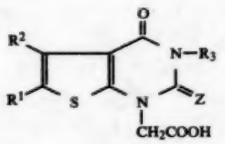


wherein R_1 and R_2 are the same or different and each represent hydrogen, halogen, lower alkyl, cycloalkyl or pheny, R_1 and R_2 taken together may form a ring with an alkylene chain, R_3 represents lower alkyl or a group of the formula

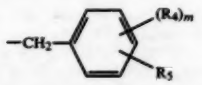


(in which R_4 is lower alkyl, lower alkoxy or halogen, m is 0, 1 or 2, and R_5 is hydrogen or halogen) and Z is oxygen or sulfur, or a pharmaceutically acceptable salt thereof.

5. An aldose-reductase inhibitor comprising an effective amount of at least one thienopyrimidine derivative of the formula



wherein R_1 or R_2 are the same or different and each represent hydrogen, halogen, lower alkyl, cycloalkyl or pheny, R_1 and R_2 taken together may form a ring with an alkylene chain, R_3 represents lower alkyl or a group of the formula



(in which R_4 is lower alkyl, lower alkoxy or halogen, m is 0, 1 or 2, and R_5 is hydrogen or halogen) and Z is oxygen or sulfur, or pharmaceutically acceptable salt thereof and a pharmaceutically acceptable carrier or excipient therefor.

4,898,868

3-DEMETHYL-4-FLUOROMEVALONIC ACID DERIVATIVES, A PROCESS FOR THE PREPARATION THEREOF, PHARMACEUTICAL PRODUCTS BASED ON THESE COMPOUNDS, THE USE THEREOF, AND INTERMEDIATES

Andreas Bergmann, Frankfurt am Main; Wilhelm Bartmann, Bad Soden am Taunus; Gerhard Beck, Frankfurt am Main, and Hans-Hermann Lau, Bad Soden am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

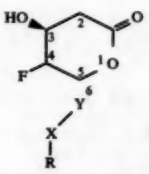
Filed Jul. 8, 1988, Ser. No. 216,752

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1987, 3722809

Int. Cl.[4] A61K *31/44;* **C07D** *213/35, 405/06*

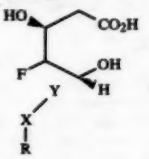
U.S. Cl. 514—277 **3 Claims**

1. A 3-demethyl-4-fluoromevalonic acid derivative of the formula I



(I)

and the corresponding free dihydroxy carboxylic acid of the formula II



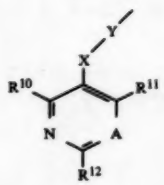
II

in which

Y-X-R denotes

R^8 and R^9 denote hydrogen, halogen, trifluoromethyl, or alkyl or alkoxy, each having 1 to 6 carbon atoms,

the group of the formula V



V

in which

X-Y is equal to CH═CH or CH_2—CH_2

A is equal to CH and

R^{10} denotes H, straight-chain C_1–C_4-alkyl, branched C_3–C_6-alkyl, trifluoromethyl or perfluoroisopropyl,

R^{11} denotes H, straight-chain C_1–C_4-alkyl, branched C_3–C_6-alkyl, cycloalkyl having 5–8 ring carbon atoms, phenyl which can be substituted 1 or 2 times by straight-chain C_1–C_3-alkyl, C_1–C_3-alkoxy, halogen or by trifluoromethyl;

R^{12} denotes H, straight-chain C_1–C_4-alkyl, branched C_3–C_6-alkyl, cycloalkyl having 5–8 ring carbon atoms, phenyl which can in turn be substituted 1 or 2 times by straight-chain C_1–C_3-alkyl, trifluoromethyl, hydroxyl or by halogen.

2. A pharmaceutical product containing an effective amount of a compound as claimed in claim 1 in combination with a pharmaceutically acceptable carrier.

4,898,869

REDUCTION OF STROKE DAMAGE

Justin A. Zivin, 31 Camp St., Paxton, Mass. 01612

Continuation of Ser. No. 20,558, Mar. 2, 1987, abandoned, which is a continuation of Ser. No. 746,042, Jun. 18, 1985, abandoned, which is a division of Ser. No. 651,501, Jun. 18, 1984, Pat. No. 4,524,072. This application Jul. 7, 1988, Ser. No. 216,084

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—280 **8 Claims**

1. A method of reducing stroke-induced neurological damage in a human patient comprising administering to the patient an effective amount of a pharmaceutically acceptable neurological-damage-reducing serotonin antagonist.

4,898,870

PYRROLOQUINOLINE QUINONE COMPOUNDS USEFUL AS AN ENZYME INHIBITOR

Yuji Narutomi, Kanagawa; Manabu Katsumata, Tokyo; Yasuko Osawa, and Saburo Uchikuga, both of Kanagawa, all of Japan, assignors to Sogo Pharmaceutical Company Limited, Tokyo, Japan

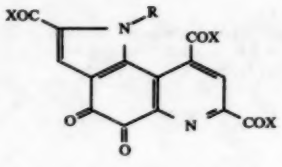
Continuation-in-part of Ser. No. 81,407, Jul. 31, 1987, abandoned. This application Jan. 19, 1989, Ser. No. 299,024

Claims priority, application Japan, Aug. 7, 1986, 61-184127; Aug. 14, 1986, 61-189542; Mar. 3, 1987, 62-046771; Jul. 27, 1987, 62-185365

Int. Cl.[4] A61K *31/47*

U.S. Cl. 514—292 **1 Claim**

1. A method for the therapy of preventing and treating diabetic complications by inhibiting aldose reductase, comprising administering to a patient in need of said therapy an amount sufficient for preventing or treating diabetic complications of a compound of the formula (I):



(I)

wherein R is hydrogen, X is OR′ or NR″R‴, and R′, R″ and R‴ are each selected from the group consisting of hydrogen and lower alkyl.

4,898,871

PYRROLE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS WHICH CONTAIN THEM AS HYPNOTICS AND ANTICONVULSANTS

Jean-Dominique Bourzat, Paris; Marc Capet, Thiais; Claude Cotrel, Paris; Richard Labaudiniere, Vitry S/Seine; Philippe Pitchen, Marolles-enBrie, and Gerard Roussel, Soisy S/Seine, all of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

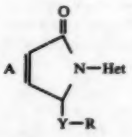
Filed Nov. 30, 1987, Ser. No. 126,352

Claims priority, application France, Dec. 2, 1986, 86 16794

Int. Cl.[4] A61K *31/435*; C07D *471/02, 211/00*

U.S. Cl. 514—300 **11 Claims**

1. A pyrrole derivative of the formula:



(I)

in which A forms with the pyrrole ring an isoindoline ring-system, Y denotes an oxygen or sulphur atom or an imino radical, Het denotes a naphthyridinyl which is unsubstituted or substituted by halogen, (1 to 4 C) alkyl, (1 to 4 C) alkyloxy, (1 to 4 C) alkylthio, cyano or trifluoromethyl and R denotes straight- or branched-chain alkenyl of 3 to 10 carbon atoms or alkyl which is unsubstituted or substituted by alkyloxy, alkylthio, cycloalkyl, alkylcarbonyl, cycloalkylcarbonyl, in which the cycloalkyl has 3 to 6 carbon atoms, cycloalkylcarbamoyl in which the cycloalkyl portion has 3 to 6 carbon atoms, amino, alkylamino, dialkylamino, alkylcarbonylamino, carbamoyl, alkylcarbamoyl, dialkylcarbamoyl, aminoalkylcarbamoyl, alkylaminoalkylcarbamoyl, dialkylaminoalkylcarbamoyl, alkyloxyalkylcarbamoyl, or phenyl, the aforesaid alkyl radicals being straight- or branched-chain radicals and containing, except where specifically stated, 1 to 10 carbon atoms each, and, when they exist, its pharmaceutically acceptable salt and optical isomers.

11. A method of producing an anxiolytic, hypnotic, anticonvulsant, antiepileptic or muscle relaxant therapeutic effect in a subject in whom such therapy is desired which comprises administering to such a subject an effective amount of a pyrrole derivative as claimed in claim 1.

4,898,872

IMIDAZO[4,5-B]PYRIDYL QUINOLONE CARDIAC STIMULANTS

Simon F. Campbell, Grey Friars; David S. Morris, Westgate-on-Sea, and David A. Roberts, Congleton, all of England, assignors to Pfizer Inc., New York, N.Y.

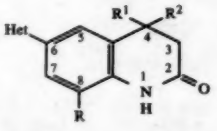
Filed Apr. 21, 1988, Ser. No. 184,462

Claims priority, application United Kingdom, Apr. 21, 1987, 8709448

Int. Cl.[4] A61K *31/47*; C07D *471/04*

U.S. Cl. 514—303 **10 Claims**

1. A heterobicyclic-substituted 2-(1H)-quinolone compound of the formula:



or a pharmaceutically acceptable salt thereof, wherein

Het is a 1(H)-imidazo(4,5-b)pyridin-6-yl group, said heterobicyclic-substituted 2-(1H)-quinolone compound being optionally substituted on the available ring carbon atoms in one or both of the rings of Het with up to three C_1–C_4 alkyl groups and being additionally optionally substituted on the sole available ring carbon atom in the imidazo portion of Het with one oxo group;

R is hydrogen or C_1–C_4 alkyl; and

R^1 and R^2 are each independently hydrogen or C_1–C_4 alkyl; and the dashed line between the 3- and 4-positions represents an optional bond in which case R^2 is absent.

4,898,873

α,α-DIARYL-4-ARYL-4-HYDROXYL-1-PIPERIDINEBUTANAMIDE, N-OXIDES AND PHARMACEUTICAL USE

Lourens Wals, Turnhout, and Ludwig P. Cooymans, Beerse, both of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Continuation of Ser. No. 888,606, Jul. 23, 1986, Pat. No. 4,824,853, and a continuation-in-part of Ser. No. 786,566, Oct. 11, 1985, abandoned. This application Jan. 9, 1989, Ser. No. 294,541

The portion of the term of this patent subsequent to Apr. 25, 2006, has been disclaimed.

Int. Cl.[4] A61K *31/445*; C07D *211/94*

U.S. Cl. 514—327 **3 Claims**

1. The compound 4-[4-chloro-3-(trifluoromethyl)phenyl]-4-hydroxy-N,N-dimethyl-α,α-diphenyl-1-piperidinebutaneamide, N-oxide.

3. A method of treating warm-blooded animals suffering from diarrhea, which method comprises the systemic administration to warm-blooded animals of an effective anti-diarrheal amount of the compound 4-[4-chloro-3-(trifluoromethyl)-phenyl]-4-hydroxy-N,N-dimethyl-α,α-diphenyl-1-piperidinebutaneamide, N-oxide.

4,898,874

ACETIC ACID DERIVATIVES OF 3-ARYL-2,1-BENZISOXAZOLE AND ESTERS AND AMIDES THEREOF

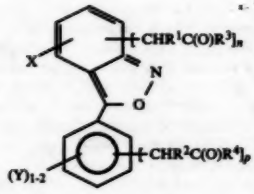
David A. Walsh, Richmond, and Ibrahim M. Uwaydah, Chesterfield, both of Va., assignors to A. H. Robins Company, Inc., Richmond, Va.

Filed Sep. 15, 1986, Ser. No. 906,965

Int. Cl.[4] A61K *31/42*; C07D *261/20*

U.S. Cl. 514—379 **66 Claims**

1. A compound selected from the group having the formula:



wherein;

R^1 and R^2 are hydrogen or methyl;

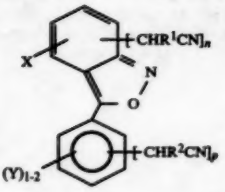
R^3 and R^4 are selected from —OH, loweralkoxy, Am or —OM wherein Am is selected from $—NH_2$, —NH-loweralkyl, or $—N(loweralkyl)_2$ and M is a pharmaceutically acceptable cation;

X is selected from hydrogen, halogen, loweralkyl, or nitro;

n and p are zero or one with the proviso that either n or p must be one or both n and p are one; and

Y is selected from hydrogen, halogen, loweralkyl, loweralkoxy, nitro or trifluoromethyl with the further proviso that X and/or Y can be loweralkyl when only the 7-position of the benzisoxazole ring is substituted by a $—CHR^1C(O)R^3$ radical and the phenyl radical carries only a Y radical.

51. A compound selected from the group having the formula:



wherein;

R^1 and R^2 are hydrogen or methyl;

X is hydrogen, halogen, loweralkyl or nitro;

n and p are zero or one with the proviso that either n or p must be one or both n and p are one; and

Y is hydrogen, halogen, loweralkyl, loweralkoxy, nitro or trifluoromethyl with the further proviso that X and/or Y can be loweralkyl when only the 7-position of the benzisoxazole ring is substituted by a

radical and the phenyl radical carries only a Y radical.

4,898,875

MERCAPTO-SUBSTITUTED HYDROXYETHYL-(TRIAZOL-L-YL) DERIVATIVES

Karl H. Büchel, Burscheid; Graham Holmwood, Wuppertal; Udo Kraatz, Leverkusen; Wolfgang Krämer, Burscheid; Paul Reinecke, Leverkusen; Wilhelm Brandes, Leichlingen, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 31, 1987, Ser. No. 91,557

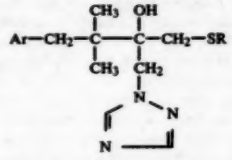
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1986, 3630129

The portion of the term of this patent subsequent to Jun. 6, 2006, has been disclaimed.

Int. Cl.[4] A01N *43/653*; C07D *249/12*

U.S. Cl. 514—383 **10 Claims**

1. A mercapto-substituted hydroxyethyl-(triazol-1-yl) compound of the formula



(I)

in which

Ar represents phenyl which can be monosubstituted, disubstituted or trisubstituted by identical or different substituents from the group consisting of halogen, alkyl with 1 to 4 carbon atoms, halogenoalkyl with 1 to 2 carbon atoms and 1 to 5 halogen atoms, halogenoalkoxy with 1 or 2 carbon atoms and 1 to 5 halogen atoms, halogenoalkylthio with 1 or 2 carbon atoms and 1 to 5 halogen atoms and phenyl.

R represents hydrogen, straight-chain or branched alkyl with 1 to 12 carbon atoms, alkenyl with 2 to 12 carbon atoms, cycloalkyl which has 3 to 6 carbon atoms, cycloalkylalkyl which has 3 to 6 carbon atoms, in the cycloalkyl part and 1 or 2 carbon atoms in the alkyl part and is optionally monosubstituted or disubstituted by halogen, or

represents aralkyl which has 6 to 10 carbon atoms, in the aryl part and 1 to 4 carbon atoms in the alkyl part, it being possible for the aryl part to be substituted by halogen, or R represents phenyl which is mono-, di- or tri-substituted by halogen and/or alkyl with 1 to 4 carbon atoms.

4,898,876

BENZOYLPIPERAZINE ESTERS AND A PROCESS FOR THEIR PRODUCTION

Setsuro Fujii, Toyonaka; Eizou Hattori, Sakado; Mitsuteru Hirata, Tokorozawa; Koichiro Watanabe, Higashi-Murayama; Kazuhiro Onogi, Iruma, and Masahiko Nagakura, Sayama, all of Japan, assignors to Kowa Co., Ltd., Nagoya, Japan

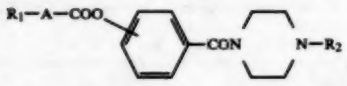
Filed Nov. 12, 1985, Ser. No. 796,525

Claims priority, application Japan, Jun. 25, 1982, 57-109192; Apr. 28, 1983, 58-75868

Int. Cl.[4] C07D *241/04*

U.S. Cl. 544—391 **14 Claims**

1. A benzoylpiperazine ester represented by the formula:

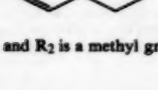


wherein

A represents a single bond or a C_1–C_2 alkylene group, vinylene group, —O—alkylene group or methine group;

R_1 represents a (C_9–C_{11}) bicyclic carbon ring which may be substituted with a lower alkyl group, lower alkoxy group, oxy group, nitro group or a halogen atom, or may be partially saturated; a fluorene group which may contain an oxo group; a fluorenylidene group; an anthracene group; a phenanthrene group which may be substituted with a lower alkyl group, or may be partially saturated; a benzofuran or thianaphthene group which may be substituted with a lower alkyl group or lower alkoxy group; a benzopyran or benzoazine group which may be substituted with an oxo group or phenyl group or may be partially saturated; a attached through an n atom; a benzodiazine group; an isooxazole which may be substituted with a lower alkyl group or phenyl group; an alkylene dioxybenzene or xanthene group; and

R_2 represents an alkyl group, C_6 cycloalkyl group, C_6 cycloalkyl(C_1)alkyl group or benzyl group, excepting the case where A is a single bond, R_1 is



and R_2 is a methyl group.

4,898,877

CIRCULATION-ACTIVE CYCLOHEXENECARBOXYLATES

Horst Meyer, West Haven, Conn.; Eckhard Schwenner; Martin Bechem, both of Wuppertal, Fed. Rep. of Germany; Rainer Gross, Wuppertal, Fed. Rep. of Germany; Matthias Schramm, Cologne, Fed. Rep. of Germany; Michael Kayser, Hagen, Fed. Rep. of Germany, and Siegbert Hebisch, Oberhausen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

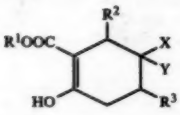
Filed Feb. 18, 1988, Ser. No. 157,678

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1987, 3706877

Int. Cl.[4] A61K *31/275, 31/215;* C07C *121/48, 121/75*

U.S. Cl. 514—521 **12 Claims**

1. A cyclohexenecarboxylate of the formula



(I)

in which

R^1 represents a straight-chain or branched saturated or unsaturated hydrocarbon radical with up to 20 carbon atoms, which is optionally interrupted by an oxygen atom or a sulphur atom in the chain, or a cyclic hydrocarbon radical with up to 20 carbon atoms, which straight-chain or branched or cyclic hydrocarbon is optionally substituted by halogen, cyano, hydroxyl, acetyloxy, nitro, nitrooxy or by a phenyl, phenoxy, phenylthio or phenylsulphonyl group which is optionally substituted by halogen, cyano, dialkylamino with in each case 1 to 2 carbon atoms to each alkyl group, alkoxy with 1 to 4 carbon atoms, alkyl with 1 to 4 carbon atoms, trifluoromethyl or nitro, or by an amino group, where this amino group carries 2 identical or different substituents from the group alkyl with up to 4 carbon atoms, alkoxyalkyl with up to 4 carbon atoms, phenyl or C_7–C_{14}-aralkyl, or an N-phenyl or N-alkyl grouping, where this alkyl group is 1 to 3 carbon atoms,

R^2 represents C_6–C_{12}-aryl, which can be mono-, di- or trisubstituted by halogen, C_1–C_8-alkyl, C_1–C_8-alkoxy, C_1–C_6-alkylthio, C_1–C_6-alkylsulphonyl, trifluoromethyl, trifluoromethoxy, difluoromethoxy, trifluoromethylthio, nitro, cyano, C_1–C_4-alkoxycarbonyl, di-C_1–C_6-alkylamino, dimethylaminosulphonyl or dimethylcarbamoyl, the substituents being identical or different,

R^3 represents C_1–C_6-alkyl or represents C_6–C_{12}-aryl, which can be mono- or disubstituted by halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, cyano, trifluoromethyl or trifluoromethoxy, the substituents being identical or different,

and

X and Y are identical or different and represent a group of the formula —CN, —COR^4, —SO_2R^4, —$COOR^5$, —$CONR^6R^7$ or —$SO_2NR^6R^7$,

wherein

R^4 denotes C_1–C_8-alkyl, C_6–C_{12}-aryl or C7C14-aralkyl,

R^5 denotes C_1–C_8-alkyl or C_6–C_{12}-aryl,

and

R^6 and R^7 are identical or different and denote C_1–C_6-alkyl, C_6–C_{12}-aryl or C_7–C_{14}-aralkyl,

with the proviso that at least one of X and Y is —CN or —$COOR^5$.

12. A method of normalizing the circulation of a patient in need thereof which comprises administering to such patient an amount effective therefor of a compound according to claim 1.

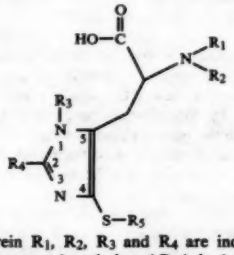
4,898,878

ANTIOXIDANT THIOHISTIDINE COMPOUNDS

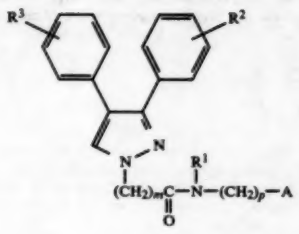
Bennett M. Shapiro; Eric E. Turner; Paul B. Hopkins; Rachel E. Klevit; Tod P. Holler, and Andreas Spaltenstein, all of Seattle, Wash., assignors to The Board of Regents of the University of Washington, Seattle, Wash.

Filed Oct. 2, 1987, Ser. No. 104,736
Int. Cl.[4] A61K *31/415*
U.S. Cl. 514—386 4 Claims

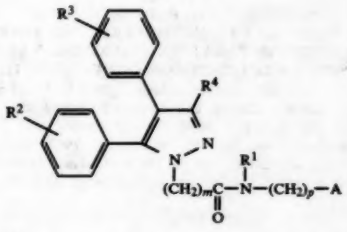
1. A method of regulating oxidative stress in an animal host, comprising the step of administering to said host an antioxidatively effective amount of a 4-thiohistidine compound of the formula:



wherein R_1, R_2, R_3 and R_4 are individually selected from hydrogen and methyl, and R_5 is hydrogen or a 4-thiohistidine.



or



or acid-addition salt thereof wherein R^1 is hydrogen or lower-alkyl; R^2 and R^3 are independently hydrogen, hydroxy, lower-alkyl, lower-alkoxy, lower-alkylamino, lower-alkylamido, lower-alkylsufonamido, nitro, amino, cyano, or halo; R^4 is hydrogen or hydroxy; m is one or two; p is one, two, or three; and A is a five-or six membered heterocycle containing carbon, hydrogen and nitrogen and attached to $(CH_2)_p$ at a carbon, or A is a five-or six-membered heterocycle, substituted with a lower-alkyl group, containing carbon, hydrogen and nitrogen and attached to $(CH_2)_p$ at a carbon.

9. A composition for treating cardiac arrhythmias comprising an amount of a compound according to claim 1 effective to treat cardiac arrhythmias together with one or more pharmaceutically acceptable excipients or diluents.

4,898,879

NURTITIONAL COMPOSITION FOR MANAGEMENT OF HEPATIC FAILURE

David C. Madsen, Libertyville, and Hugh N. Tucker, Chicago, both of Ill., assignors to Baxter International Inc., Deerfield, Ill.

Continuation of Ser. No. 935,887, Mar. 9, 1987, abandoned, which is a continuation of Ser. No. 805,394, Dec. 3, 1985, abandoned, which is a continuation of Ser. No. 479,104, Mar. 28, 1983, abandoned, which is a continuation of Ser. No. 278,914, Jun. 29, 1981, abandoned. This application Jun. 17, 1988, Ser. No. 208,805
Int. Cl.[4] A61K *31/195, 31/415*
U.S. Cl. 514—400 22 Claims

1. A composition for administration to a patient having liver disease, comprising a cysteine free mixture of nonessential and essential amino, having from 8 to 16 total mole % of the composition consisting of L-serine, L-histidine, L-threonine, L-tryptophan, L-glutamine and glycine taken together; said L-theronine contributing from about 2.3 to 3.9% of the total mole % of said composition.

4,898,880

N-(HETEROCYCLE)ALKYL)-1H-PYRAZOLE-1-ALKANAMIDES AS ANTIARRHYTHMIC AGENTS, COMPOSITIONS AND USE

Denis M. Bailey, East Greenbush; George Y. Lesher, Schodack, and Thomas E. D'Ambra, North Greenbush, all of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Mar. 22, 1989, Ser. No. 327,218
Int. Cl.[4] A61K *31/415;* C07D *403/12*
U.S. Cl. 514—406 16 Claims

1. A compound of formula

4,898,881

DRY MICROBIOCIDAL COMPOSITION CONTAINING AN ETHYLENE BIS-DITHIOCARBAMATE SALT

Girish K. Patel, Hixson, and James H. Belcher, Chattanooga, both of Tenn., assignors to Alco Chemical Corporation, Tenn.

Filed Apr. 14, 1988, Ser. No. 181,415
Int. Cl.[4] A61K *31/27;* A01N *47/10*
U.S. Cl. 514—481 12 Claims

1. A dry water soluble composition for use as a microbiocide comprising a mixture of a sodium or potassium salt of ethylene bis-dithiocarbamate and a sodium or potassium salt of dimethyldithiocarbamate in a weight ratio of between about 4:1 and about 1:4, said composition being free of water of solution and of a substantial amount of water of crystalization and having a temperature of combustion over 170° C.

4,898,882

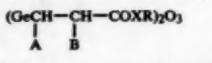
RESISTANCE IMPARTING AGENT FOR COLD SYNDROME OF LOW PULMONARY FUNCTION PATIENTS

Fumio Nagahama, Sapporo; Norihiro Kakimoto, Machida, and Kohei Miyao, Tokyo, all of Japan, assignors to Asai Germanium Research Institute, Tokyo, Japan

Continuation of Ser. No. 869,698, Jun. 2, 1986, abandoned. This application Dec. 12, 1988, Ser. No. 284,848
Int. Cl.[4] A61K *31/28*
U.S. Cl. 514—492 9 Claims

1. A method for treating or imparting resistance to a cold

syndrome in a patient having low pulmonary function, said method comprising administering an effective amount to treat a cold syndrome of an organogermanium compound having the formula:



(I)

wherein A and B independently represent a hydrogen atom or a lower alkyl group, R represents a combination of one or two atoms or groups as identified above by A and B, and X represents an oxygen or nitrogen atom and a pharmaceutically acceptable carrier.

4,898,883

1-SUBSTITUTED DERIVATIVES OF 4-METHOXY-2,3,6-TRIMETHYLBENZENE, PROCESS FOR THEIR PREPARATION AND MEDICINAL AND COSMETIC COMPOSITIONS CONTAINING THEM

Gerard Lang, Saint Gratien; Serge Forestier, Claye-Souilly; Alain Lagrange, Chatou, and Braham Shroot, Antibes, all of France, assignors to L'Oreal, Paris, France

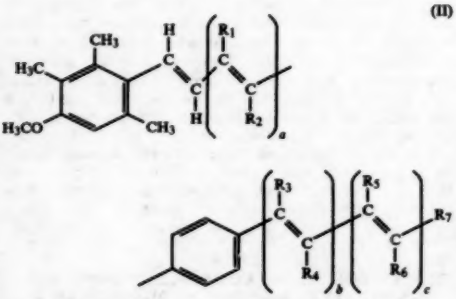
Continuation of Ser. No. 765,150, Aug. 13, 1985, abandoned. This application Jul. 21, 1987, Ser. No. 75,890

Claims priority, application Luxembourg, Aug. 13, 1984, 85502

Int. Cl.[4] A61K *31/19, 31/21;* **C07C** *65/28*

U.S. Cl. 514—544 **18 Claims**

1. A compound having the formula



(II)

wherein

a is 1 and b and c, each independently, are 0 or 1;

R_1, R_2, R_3, R_4, R_5 and R_6, each independently, are selected from the group consisting of hydrogen and C_1–C_6 alkyl;

R_7 is selected from the group consisting of (i) $—CH_2OR_8$ wherein R_8 is selected from the group consisting of hydrogen, C_1–C_6 alkyl, C_2–C_6 monohydroxyalkyl, C_2–C_6 polyhydroxyalkyl, cyclopentyl and cyclohexyl and (ii) a group of the formula

wherein R_9 is hydrogen $—OR_{10}$ wherein R_{10} is selected from the group consisting of hydrogen, C_1–C_{18} alkyl, C_2–C_6 monohydroxyalkyl and C_2–C_6 polyhydroxyalkyl, or an isomer or salt thereof.

4. A pharmaceutical composition comprising in a pharmaceutically acceptable carrier at least one compound of formula II of claim 1 in an amount effective to treat dermatologic complaints.

15. A cosmetic composition comprising in a cosmetically acceptable carrier, at least one compound of formula II of claim 1 in an amount effective for use in body hygiene and hair care, for the treatment of acne, seborrhea and hair loss, for regrowth of hair and for protection against damage by sunlight.

4,898,884

METHOD AND COMPOSITION FOR TREATING ARTHRITIS

W. Keith R. Watson, P.O. Box 1537, Rancho Santa Fe, Calif. 92067, assignor to Kenneth R. Watson and William W. Haefliger, Pasadena, Calif., a part interest

Continuation of Ser. No. 656,751, Oct. 1, 1984, abandoned, which is a continuation of Ser. No. 426,868, Sep. 29, 1982, abandoned. This application Feb. 16, 1986, Ser. No. 828,941

Int. Cl.[4] A61K *31/110, 31/185, 31/195*

U.S. Cl. 514—553 **5 Claims**

1. A method for producing a solution useful for treating a human or animal patient afflicted with arthritis to alleviate inflammation, pain and swelling caused by calcium phosphates in bone or joint tissue, by topically applying an effective amount of said solution to the patient's skin surface overlying the inflammed, painful and swollen area of the patient for a period of time sufficient to alleviate said inflammation, pain and swelling, which method comprises:

(a) forming said solution consisting essentially of a mixture of dimethyl sulfoxide and citric acid or citric acid monohydrate by combining between about 20 to 50 weight percent of said citric acid or citric acid monohydrate and between about 80 to 50 weight percent dimethyl sulfoxide,

(b) and heating and mixing said citric acid or citric acid monohydrate and dimethyl sulfoxide during the formation of said solution.

4,898,885

PHARMACEUTICA AND DIETARY COMPOSITIONS

David F. Horrobin, Surrey, England, assignor to Efamol Limited, Surrey, England

Continuation of Ser. No. 833,286, Feb. 27, 1986, abandoned. This application Aug. 15, 1988, Ser. No. 232,515

Claims priority, application United Kingdom, Mar. 8, 1985, 8506027

Int. Cl.[4] A61K *31/20*

U.S. Cl. 514—560 **4 Claims**

1. A method of treatment of benign prostatic hypertrophy wherein gamma-linolenic acid or dihomo-gamma-linolenic acid or both, as such or in the form of an acceptable and physiologically equivalent derivative, is administered to a person suffering from the same in an amount of 0.1 mg to 10 g of the or each acid, or molar equivalent amounts, of said derivatives, daily.

4,898,886

UREA AGAINST ADENOCARCINOMA

Joaquin Amat-Larraz, Paseo De La Liberacion 132, Benicarlo/-Castellon, Spain

Continuation of Ser. No. 717,084, Mar. 28, 1985, abandoned. This application Jun. 22, 1988, Ser. No. 211,156

Claims priority, application Switzerland, Mar. 28, 1984, 1563/84

Int. Cl.[4] A61K *31/17, 31/34*

U.S. Cl. 514—588 **6 Claims**

1. A method of treating animals with adenocarcinoma cancer comprising administering by injection to the affected animal an effective amount of composition comprising about 45% by weight urea, about 8% to about 9% by weight ascorbic acid, about 1% to about 2% by weight sodium bicarbonate and about 45% by weight physiological NaCl solution.

4,898,887

COMPOUNDS AND COMPOSITIONS HAVING ANTI-INFLAMMATORY AND ANALGESIC ACTIVITY

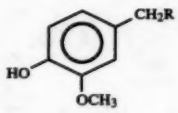
John M. Janusz, Fairfield; Maurice E. Loomans, Cincinnati, both of Ohio; Thomas R. LaHann, Pullman, Wash., and Gerald B. Kasting, Wyoming, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 805,481, Dec. 4, 1985, abandoned, which is a continuation of Ser. No. 684,427, Dec. 20, 1984, abandoned. This application Aug. 22, 1986, Ser. No. 899,459

Int. Cl.[4] A61K *31/16*; C07C *103/60*

U.S. Cl. 514—617 21 Claims

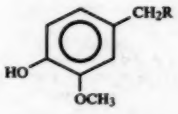
1. N-vanillylamide compounds, and pharmaceutically-acceptable salts thereof, of the formula:



wherein R is a straight or branched chain tri-unsaturated or tetra-unsaturated fatty acid amide having from 14 to 24 carbon atoms.

16. A method for reducing inflammation and producing analgesia in humans or lower animals, which comprises administering to said human or lower animal a safe and effective amount of a composition comprising:

(a) a safe and effective amount of a N-vanillylamide compound of the formula



wherein R is a straight or branched chain tri-unsaturated or tetra-unsaturated fatty acid amide having from 14 to 24 carbon atoms, or a pharmaceutically-acceptable salt thereof, or mixtures thereof; and

(b) a pharmaceutically-acceptable carrier.

4,898,888

TREATMENT OF VIRUS INFECTIONS WITH GANGLIONIC BLOCKING AGENTS

Joseph A. Baldone, 1211 Royal St., New Orleans, La. 70116

Continuation of Ser. No. 19,116, Feb. 26, 1987, abandoned, which is a continuation of Ser. No. 756,653, Jul. 19, 1985, abandoned, which is a continuation-in-part of Ser. No. 743,889, Jun. 12, 1985, abandoned, which is a continuation of Ser. No. 631,645, Jul. 16, 1984, abandoned, which is a continuation-in-part of Ser. No. 456,732, Jan. 10, 1983, abandoned. This application Oct. 5, 1988, Ser. No. 214,881

Int. Cl.[4] A61U *31/14*

U.S. Cl. 514—642 10 Claims

1. A method for treating infection or disease in a mammal caused by herpes simplex virus type-1 or herpes simplex virus type-2 comprising the step of administering to the mammal a ganglionic blocking agent selected from the group consisting of tetraethylammonium ion, hexamethonium ion, pentalinium ion, chlorisondamine ion, trimethidinium ion, trimethaphan ion, mecamylamine, pempidine, and homologs thereof in an effective dosage.

4,898,889

METHODS FOR THE TREATMENT OF HYPERTENSION

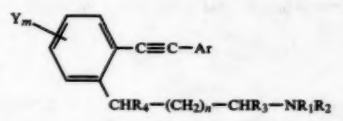
John R. Carson, Norristown, Pa., assignor to McNeilab, Inc., Spring House, Pa.

Continuation of Ser. No. 820,825, Jan. 21, 1986, abandoned, which is a continuation of Ser. No. 553,725, Nov. 21, 1983, abandoned. This application Mar. 27, 1989, Ser. No. 329,178

Int. Cl.[4] A61K *31/135, 31/40, 31/445, 31/535*

U.S. Cl. 514—654 9 Claims

1. A method for controlling hypertension in an animal which comprises administering to the animal a therapeutically effective antihypertensive amount of an acetylene of the following formula (I):



(I)

wherein

Y is independently alkyl, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, alkanoyloxy, alkanoylamino, amino, monoalkylamino, dialkylamino, hydroxy, halogen or cyano or methylenedioxy or ethylenedioxy at adjacent ring carbons;

m is 0, 1, 2 or 3;

Ar is phenyl or a 5- or 6-membered heterocyclic aromatic ring attached via a ring carbon to the acetylene moiety, which rings may be substituted independently by one or more of alkyl, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, carboxamido, halogen, fluoroalkyl or cyano;

R_1 and R_2 are independently hydrogen, alkyl, cycloalkyl or cycloalkylalkyl or R_1 and R_2 are alkyl and are joined to form a 5- to 7-membered saturated ring which ring may contain an oxygen or sulphur atom or an NR_5 moiety wherein R_5 is hydrogen or alkyl;

R_3 is hydrogen, alkyl or alkoxyalkyl;

R_4 is hydrogen or alkyl; and

n is 0, 1 or 2,

and the pharmaceutically acceptable acid addition salts and the quaternary ammonium compounds thereof.

4,898,890

MEDICINES FOR USE IN THE THERAPY AND PREVENTION OF KIDNEY AND LIVER DISEASES

Toshio Sato; Hitoshi Matsumoto, and Hisao Kakegawa, all of Tokushima, Japan, assignors to Dainippon Ink and Chemicals, Inc. and Nippon Hypox Laboratories Incorporated, both of Tokyo, Japan

PCT No. PCT/JP87/00409, § 371 Date Dec. 23, 1987, § 102(e) Date Dec. 23, 1987, PCT Pub. No. WO87/07835, PCT Pub. Date Dec. 30, 1987

PCT Filed Jun. 22, 1987, Ser. No. 157,509

Claims priority, application Japan, Jun. 21, 1986, 61-145829; Sep. 2, 1986, 61-205118

Int. Cl.[4] C07O *311/60*

U.S. Cl. 514—685 52 Claims

1. A method for the therapy and prevention of kidney diseases or liver diseases, comprising administering to a mammal a medicine containing a therapeutically or prophylactically effective amount for the therapy and prevention of kidney diseases, or liver diseases of isoliquiritigenin as an active ingredient.

4,898,891

ANTIVIRAL COMPOSITIONS

David Lavie; Michel Revel; Dalia Rotman, all of Rehovot, Israel, and Vincent V. Velde, Brussels, Belgium, assignors to Yeda Research and Development Company Ltd., Rehovot, Israel

Filed Aug. 7, 1987, Ser. No. 82,700
Int. Cl.[4] A61K *31/05, 31/045*
U.S. Cl. 514—732 16 Claims

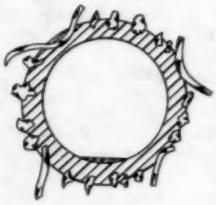
9. A method of treating vial infections in a mammal afflicted with a viral infection, comprising administering to said mammal an effective antiviral amount of a substantially pure compound selected from the group consisting of hypericin, pseudohypericin, a pharmaceutically acceptable salt of hypericin or pseudohypericin, and mixtures thereof in any desired ratio.

4,898,892

METHODS FOR PREPARING OPAQUE COATINGS AND APPLYING THE SAME

George E. Melber, Depew, and Leon Wolinski, Checktowago, both of N.Y., assignors to Pierce & Stevens Corporation, Buffalo, N.Y.

Division of Ser. No. 225,755, Jul. 29, 1988, which is a continuation-in-part of Ser. No. 28,119, Mar. 19, 1987, Pat. No. 4,722,943, and a continuation-in-part of Ser. No. 103,203, Oct. 1, 1987, and a continuation-in-part of Ser. No. 103,204, Oct. 1, 1987, said Ser. No. 28,119, is a division of Ser. No. 103,203, , which is a division of Ser. No. 103,204,. This application Jun. 6, 1989, Ser. No. 362,316
Int. Cl.[4] C08J *9/22, 9/32*
U.S. Cl. 521—54 13 Claims



1. The method of making an opaque coating comprising combining a film forming coating binder and a composite opacifier, said composite opacifier comprising dry expanded thermoplastic resin microspheres having an inorganic opacifying constituent adhered to and embedded the surface thereof, said opacifying constituent having a refractive index of greater than about 1.6, and said composite opacifier having a hiding power substantially equivalent to that of said opacifying constituent having a refractive interface with air.

4,898,893

BLOWING AGENTS FOR ISOCYANURATE FOAMS AND METHOD FOR PRODUCING THE SAME

Kaneyoshi Ashida, Farmington Hills, Mich., assignor to Harry A. Fischer, Canada

Filed Sep. 20, 1988, Ser. No. 246,877
Int. Cl.[4] C08G *18/14*
U.S. Cl. 521—131 29 Claims

1. A blowing agent for a resinous material; the blowing agent consisting essentially of a blend of:

(a) a flammable liquid hydrocarbon; and

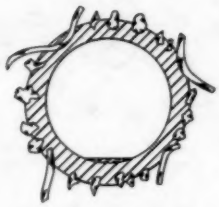
(b) a halogenated aliphatic hydrocarbon; and wherein the blowing agent has a boiling point of between about 30° C. to 100° C.

4,898,894

FILM FORMING BINDERS CONTAINING LOW DENSITY COMPOSITE OPACIFIERS

George E. Melber, Depew, and Leon Wolinski, Checktowago, both of N.Y., assignors to Pierce & Stevens Corporation, Buffalo, N.Y.

Division of Ser. No. 225,755, Jul. 29, 1988, which is a continuation-in-part of Ser. No. 28,119, Mar. 19, 1987, Pat. No. 4,722,943, and a continuation-in-part of Ser. No. 103,203, Oct. 1, 1987, and a continuation-in-part of Ser. No. 103,204, Oct. 1, 1987, said Ser. No. 28,119, is a division of Ser. No. 103,203, Oct. 1, 1987, and Ser. No. 103,204, Oct. 1, 1987. This application Jun. 6, 1989, Ser. No. 362,315
Int. Cl.[4] C08J *9/22, 9/32*
U.S. Cl. 521—54 7 Claims



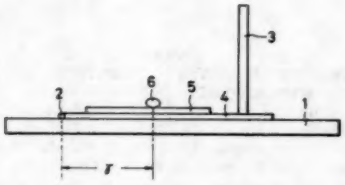
1. A composition for use in the making of paints and coatings comprising a film-forming coating binder and an opacifier, said opacifier comprising expanded thermoplastic resin microspheres having an inorganic opacifying constituent adhered to an embedded in the surface thereof.

4,898,895

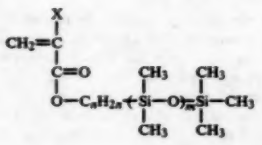
ANTIFOULING PAIN HAVING A POLYACRYLATE COMPONENT WITH PENDENT SILYL OR SILOXANE GROUPS

Shigeru Masuoka; Hiroshi Doi, both of Hyogo, and Yoshihiro Honda, Osaka, all of Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

Filed Dec. 30, 1987, Ser. No. 139,541
Claims priority, application Japan, Dec. 30, 1986, 61-311221; Jun. 28, 1987, 62-160089
Int. Cl.[4] C08F *30/08*; C08L *31/00, 31/02*; C09D *5/14*
U.S. Cl. 523—122 6 Claims



1. An antifouling paint comprising an antifoulant and a polymer formed from a monomer represented by formula (I):



(I)

wherein X is a hydrogen atom or a methyl group; n is an integer of 2 to 4; and m signifies the average degree of polymerization and is zero or a positive integer.

4,898,896

TRANSPARENT COPOLYAMIDE FROM OLIGOMERIC AMIDE AND CYCLOALIPHATIC DIAMINE AND PROCESS FOR THE PRODUCTION THEREOF

Philippe Maj; Philippe Blondel, both of Bernay, and Daniel Cuzin, Port Marly, all of France, assignors to Atochem, France

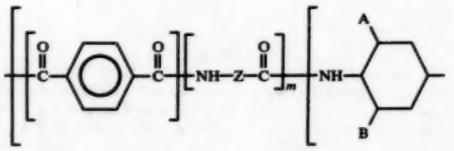
Filed Sep. 26, 1988, Ser. No. 249,376

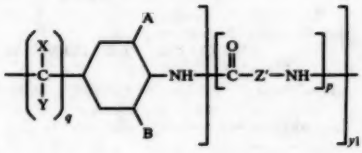
Claims priority, application France, Oct. 21, 1987, 87 14542

Int. Cl.[4] C08G *69/14, 69/26, 69/08*

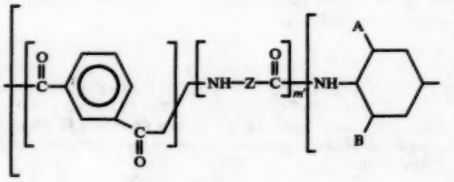
U.S. Cl. 528—323 **7 Claims**

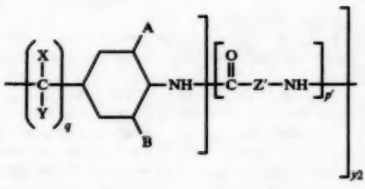
1. A transparent polyamide containing terephthalic acid radicals or radicals of the mixture of terephthalic and isophthalic acids and a cycloaliphatic diamine radical and having the chain formations:





and





in which:

y_1+y_2 is between 10 and 200 with $y_1/(y_1+y_2)>0.5$;

m, p, m' and p' are whole numbers equal to or greater than zero, such that:

$$\left[\frac{y_1}{y_1+y_2}(m+p)\right]+\left[\frac{y_2}{y_1+y_2}(m'+p')\right]$$

is between 0.5 and 10, taken statistically over the macromolecule;

Z and Z' are the same or different and are either a polymethylene segment $-(CH_2)-_n$ where n is a whole number equal to or greater than 6 or a sequence containing an amide resulting from condensation of an aliphatic diamine containing at least 6 carbon atoms between the amine functions and an aliphatic dicarboxylic acid containing at least 4 carbon atoms between the acid functions;

A and B are the same or different and represent hydrogen or a methyl, ethyl, or isopropyl radical;

X and Y are the same or different and represent hydrogen or a methyl radical; and

q is a whole number between 0 and 6.

4,898,897

PROCESS FOR PRODUCING POLYESTER RESIN COMPOSITION

Kazuto Kiyohara; Toshiaki Yamazaki; Ichiya Harada; Takanori Nakadate, all of Hino; Kentaro Noguchi, Hofu; Michiteru Nakano, Hofu; Shigeru Sakae, Hofu, and Kazuhiro Okuma, Hofu, all of Japan, assignors to Konica Corporation and Kanebo Ltd., both of, Japan

Filed Apr. 21, 1988, Ser. No. 184,389

Claims priority, application Japan, Apr. 24, 1987, 62-101310; Apr. 25, 1987, 62-102810

Int. Cl.[4] C08K *3/36, 3/34, 3/30, 3/26*

U.S. Cl. 523—343 **17 Claims**

1. A process for producing a polyester resin composition containing at least 10 wt % of a white inorganic pigment dispersed in a polyester resin, which comprises kneading the polyester resin with the white inorganic pigment and thereafter subjecting the blend to a polycondensation reaction at a temperature ranging from the melting point of the polyester up to 300° C. and at a reduced pressure of not higher than 5 Torr.

9. A process for producing a polyester resin composition containing at least 10 wt % of a white inorganic pigment dispersed in a polyester resin, which comprises kneading and dispersing said white inorganic pigment in at least part of a molten polyester resin withdrawn from a continuous polycondensation apparatus, mixing the blend with a polyester resin also withdrawn from a continuous polycondensation apparatus but which has not been kneaded with the white inorganic pigment, and subjecting the resin mixture to a polycondensation reaction at a temperature ranging from the melting point of the polyester up to 300° C. and at a pressure not higher than 5 Torr.

4,898,898

POLYMER-DENSIFIED FILLERS

Thomas H. Fitzgerald, Guilderland; John S. Razzano, Coboes, and Todd R. Stegman, Troy, all of N.Y., assignors to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 915,939, Oct. 6, 1986, abandoned, which is a continuation of Ser. No. 539,587, Oct. 6, 1983, abandoned. This application May 19, 1989, Ser. No. 355,106

Int. Cl.[4] C08K *3/34;* **C08J** *3/20*

U.S. Cl. 523—351 **25 Claims**

1. A method for providing polymer-densified fillers, consisting essentially of:

(A) adding to a suitable mixing vessel;

(i) 100 parts by weight of a silicone polymer or mixture of silicone polymers having a viscosity ranging from about 1000 to about 200,000,000 centipoise at 25° C.; and

(ii) an amount of filler comprising:

(a) 50 to 500 parts by weight of reinforcing filler per 100 parts by weight of said silicone polymer; and

(b) 900 to 5000 parts by weight of extending filler per 100 parts by weight of said silicone polymer; and

(B) mixing said silicone polymer and said filler for an amount of time effective for providing a free-flowing particulate mixture having a density at least 100 percent higher than

when the silicone polymer and filler first became free-flowing particles.

4,898,899

ADHESIVE COMPOSITION

Yasuji Isobe, Seto, Japan, assignor to Toagosei Chemical Industry Co., Tokyo, Japan

Filed Dec. 5, 1988, Ser. No. 280,174

Claims priority, application Japan, Dec. 25, 1987, 62-327294; Jul. 11, 1988, 63-170977; Sep. 19, 1988, 63-232568; Sep. 19, 1988, 63-232569

Int. Cl.[4] C09K *5/34*

U.S. Cl. 524—90 **40 Claims**

1. An anaerobic adhesive composition which comprises a polymerizable methacrylate monomer, a peroxide polymerization initiator, and at least one compound selected from the group consisting of chlorophyll, metal-substituted chlorophyll, chlorophyllin salt and pthalocyanine complex unsubstituted or substituted on a benzene nucleus thereof.

4,898,900

3,3-OXY-BIS{[2,2'-DI(BROMOMETHYL)]}PROPANOIC ACID DERIVATIVES

Michael Peled, Beer-Sheva, Israel, assignor to Bromine Compounds Ltd., Beer-Sheva, Israel

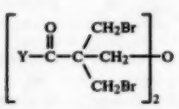
Filed Dec. 27, 1988, Ser. No. 290,154

Claims priority, application Israel, Dec. 28, 1987, 84953

Int. Cl.[4] C07C *103/727, 103/147, 59/315, 69/708;* C08K *5/20, 5/11, 5/09*

U.S. Cl. 524—220 **17 Claims**

1. 3,3'-Oxy-bis{[2,2'-di(bromomethyl)]propanoic acid} derivatives of formula (I)



(I)

in which Y represents OR, chlorine or NH—R and wherein R represents hydrogen or an alkyl, aralkyl or aryl group, wherein the alkyl, aryl and aralkyl groups are unsubstituted or substituted with 1 to 5 bromine atoms.

12. A flame-retardant composition comprising a synthetic resin and a compound of Formula I according to claim 1, alone or in admixture with conventional flame-retardant synergistic materials additives or mixtures thereof.

4,898,901

LONG CHAIN N-ALKYL-ALPHA-ALKYL NITRONES AND POLYOLEFIN COMPOSITIONS STABILIZED THEREWITH

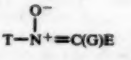
Ramanathan Ravichandran, Yonkers, N.Y.; Stephen D. Pastor, Basel, Switzerland; Raymond Seltzer, New City, N.Y., and Ambelal R. Patel, Ardsley, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 105,417, Oct. 7, 1987, abandoned. This application Mar. 23, 1989, Ser. No. 330,986

Int. Cl.[4] C07C *135/00;* C08K *5/32*

U.S. Cl. 524—237 **28 Claims**

1. A long chain N-alkyl-alpha-alkyl nitrone compound of the formula



wherein

T is a straight or branched chain alkyl of 16 to 18 carbon atoms,

G is hydrogen, methyl or ethyl,

E is a straight or branched chain alkyl of 13 to 17 carbon atoms, and

where the sum of the carbon atoms in G plus E is equal to 15 to 17.

10. A stabilized composition which comprises

(a) a saturated polyolefin or mixture thereof, and

(b) a stabilizing amount of a long chain N-alkyl-alpha-alkyl nitrone of the formula

wherein

T is a straight or branched chain alkyl of 16 to 18 carbon atoms,

G is hydrogen, methyl or ethyl,

E is a straight or branched chain alkyl of 13 to 17 carbon atoms, and

where the sum of the carbon atoms in G plus E is equal to 15 to 17.

4,898,902

BINDER COMPOSITION FOR INJECTION MOLDING

Tomoaki Nagai; Hideyuki Yamanashi, and Hideo Hachimori, all of Tokyo, Japan, assignors to Adeka Fine Chemical Co., Ltd. and Asahi Denka Kogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Jun. 27, 1988, Ser. No. 211,756

Claims priority, application Japan, Jul. 3, 1987, 62-166297; May 31, 1988, 63-133864

Int. Cl.[4] C08L *71/02;* C08K *5/10*

U.S. Cl. 524—275 **17 Claims**

1. A binder composition for injection molding of at least one of metal powder and ceramic powder which comprises polyoxyethylene/polyoxyproplyene condensation polyether as the main component together with from 10 to 100 parts by weight of at least one auxiliary component selected from the group consisting of natural waxes, synthetic waxes, fatty acids and esters per 100 parts of said polyoxyethylene/polyoxypropylene condensation polyether.

4,898,903

THERMALLY STABLE FLUORINATED ORGANOSILOXANE GEL COMPOSITION

Diane M. Rasch, Alameda, Calif., and Lawrence D. Fiedler, Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Mar. 14, 1989, Ser. No. 322,865

Int. Cl.[4] C08K *5/04*

U.S. Cl. 524—398 **7 Claims**

1. In an organosiloxane composition curable to a clear, thermally stable fluorosilicone gel, said composition comprising

A. a liquid diorganovinylsiloxy terminated polydiorganosiloxane wherein at least 25 percent of the silicon atoms are bonded to a fluorine containing hydrocarbon radical;

B. a compatible liquid fluorine-containing organohydrogensiloxane having an average of more than two silicon bonded hydrogen atoms per molecule in an amount sufficient to provide a molar ratio of silicon bonded hydrogen atoms to vinyl radicals in said composition of from 0.5 to about 1.0; and

C. an amount sufficient to promote curing of said composition of a platinum-containing catalyst, p1 the improvement comprising the presence in said composition of up to 0.1 percent, based on the weight of said composition, of copper acetylacetonate to minimize hardening and surface deformation of the cured gel at temperatures above 100° C.

4,898,904

METHOD TO MODIFY POLY(ARYLE SULFIDE) RESINS

Michael C. Yu; Lacey E. Scoggins, and Jerry O. Reed, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 933,518, Nov. 21, 1986, abandoned. This application Apr. 4, 1988, Ser. No. 177,255

Int. Cl.[4] C08K *5/09, 5/13, 3/22*

U.S. Cl. 524—399 10 Claims

1. A process comprising mixing poly(arylene sulfide) resin with an effective amount of a melt flow rate additive at a temperature above the melting temperature of the poly(arylene sulfide) resin to produce a final resin product having reduced melt flow rate and reduced melt crystallization temperature compared to said poly(arylene sulfide) resin alone and before treatment, wherein the melt flow rate additive is selected from among the group consisting of cadmium acetate, mercury acetate and zinc propionate and is present in an amount of from about 0.1 to about 2 weight percent based on the total composition.

4,898,905

SLIDING MATERIAL

Shinya Kawakami, and Masahara Kikuchi, both of Toyota, Japan, assignors to Taiho Kogyo Co., Ltd., Toyoto, Japan

Filed Jul. 11, 1988, Ser. No. 217,522

Claims priority, application Japan, Jul. 13, 1987, 62-172955

Int. Cl.[4] C08K *3/38, 3/36, 3/34, 3/04*

U.S. Cl. 524—404 7 Claims

1. A sliding material for use under boundary lubricating condition or mixed lubricating condition, consisting essentially of from more than 30 to 60% by weight of graphite, from 1 to less than 30% by weight of at least one lubricant selected from the group consisting of polytetrafluoroethylene, MoS_2, Pb, and BN, and from 10 to less than 60% by weight of a polyimide and a polyamide-imide.

4,898,906

COMPOSITIONS BASED ON VINYLIDENE FLUORIDE POLYMERS WHICH HAVE A REDUCED SMOKE-GENERATING CAPACITY

Etienne Hannecart, Tervueren, Belgium, assignor to Solvay & Cie, Brussels, Belgium

Continuation of Ser. No. 539,063, Oct. 4, 1983, abandoned. This application Aug. 28, 1987, Ser. No. 91,309

Claims priority, application France, Oct. 11, 1982, 82 17123

Int. Cl.[4] C08K *3/24*

U.S. Cl. 524—406 6 Claims

1. Vinylidene fluoride polymer composition, comprising:

at least 85 mole percent monomeric units derived from vinylidene fluoride and an effective amount of a smoke reducer consisting of a molybdate of calcium, zinc, or aluminum.

4,898,907

COMPOSITIONS OF PLATINUM AND RHODIUM CATALYST IN COMBINATION WITH HYDROGEN SILSESQUIOXANE RESIN

Loren A. Haluska; Keith W. Michael, both of Midland, and Leo Tarhay, Sanford, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 937,273, Dec. 3, 1986, Pat. No. 4,822,697. This application Oct. 27, 1988, Ser. No. 263,206

Int. Cl.[4] C08K *5/01*

U.S. Cl. 524—490 9 Claims

1. A composition of matter comprising a solvent solution of a mixture of

(a) hydrogen silsesquioxane resin, and

(b) a metal catalyst selected from the group consisting of platinum catalysts and rhodium catalysts.

4,898,908

ANIONIC POLYMER HYDROGELS AND A PROCESS FOR MAKING THE SAME

Shawqui Lahalih, and George Hovakeemian, both of Safat, Kuwait, assignors to Kuwait Institute for Scientific Research, Safat, Kuwait

Filed Jan. 26, 1989, Ser. No. 301,948

Int. Cl.[4] C08J *61/00*; C08K *00/00*

U.S. Cl. 524—593 12 Claims

1. An anionic polymeric hydrogel consisting essentially of sulfonated aminoformaldehyde resin having a capability to absorb at least three (3) times its own weight of deionized water.

4,898,909

AQUEOUS POLYACRYLATE DISPERSIONS AND THEIR USE FOR THE PRODUCTION OF SELF-ADHESIVE STRUCTURES HAVING GOOD LOW TEMPERATURE ADHESION

Juergen Vietmeier, Wachenheim; Peter Pfoehler, Speyer; Gundo Brauch, Wachenheim; Wolfgang Druschke, Dirmstein, and Albrecht Zosel, Weinheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 30, 1987, Ser. No. 139,822

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1987, 3700248

Int. Cl.[4] C08L *33/00*

U.S. Cl. 524—820 2 Claims

1. A 40–70% strength aqueous dispersion of a copolymer having a glass transition temperature of not more than −45? C. and a K value greater than 80 and consisting of

(a) from 90 to 95% by weight of one or more nontertiary acrylates of alkanols of 8 to 12 carbon atoms,

(b) from 0 to 18% by weight of at least one of acrylates or methacrylates of alkanols of 1 to 4 carbon atoms, vinyl esters of carboxylic acids of 2 to 4 carbon atoms, (meth)acrylonitrile or styrene,

(c) from 0.1 to 4% by weight of at least one of α,β-monoolefinically unsaturated mono- or dicarboxylic acids of 3 to 5 carbon atoms or their amides, which are unsubstituted or substituted at the nitrogen atoms by alkyl of 1 to 4 carbon atoms or carboxyl, or hydroxylalkyl acrylates where alkyl is of 2 to 5 carbon atoms, and

(d) from 0.01 to 3% by weight of α- methylstyrene.

4,898,910

MODULUS CONTROL IN SILICONE SEALANT

Russell P. Kamis, County of Bay; Jerome M. Klosowski, Bay City, and Loren D. Lower, Midland, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Sep. 26, 1988, Ser. No. 249,731

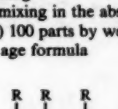
Int. Cl.[4] C08L *83/04*

U.S. Cl. 524—860 4 Claims

1. A silicone sealant, containing polydiorganosiloxane having alkoxy endblocking, alkoxy functional crosslinker and/or chain extender, and titanium catalyst, produced by a method comprising

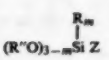
(A) mixing in the absence of moisture

(1) 100 parts by weight of a polymer mixture of the average formula



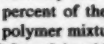
where each R is free of aliphatic unsaturation and is at least one selected from the group consisting of monovalent hydrocarbon, monovalent halohydrocarbon, and monovalent cyanoalkyl radicals of 1 to 18 inclusive

carbon atoms, each D is selected from the group consisting of the vinyl radical and radicals of the formula



where each R'' is at least one selected from the group consisting of methyl, ethyl, propyl, and butyl, Z is a divalent hydrocarbon radical or combination of divalent hydrocarbon radicals and siloxane radicals, m is 0 or 1, and x is of a value such that the polymer has a viscosity of from 0.5 to 3000 Pa.s at 25° C., from 3 to 40 percent of the total of endblocking radicals D in the polymer mixture being vinyl radicals,

(2) from 0.1 to 14 parts by weight of an alkoxysilane of the formula



where R' is at least one selected from the group consisting of methyl, ethyl, propyl, phenyl, and vinyl, R'' is as defined above and a is 0, 1, or 2 and

(3) from 0.2 to 6 parts by weight of titanium catalyst, and

(4) optional filler,

(B) storing the mixture in the absence of moisture,

to give a sealant which is stable in the absence of moisture and has a modulus which is at a desired level after cure of the sealant.

4,898,911

RESIN COMPOSITION

Shunitsu Miyashita, and Kenji Mogami, both of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki, Osaka, Japan

Continuation-in-part of Ser. No. 122,738, Nov. 19, 1987. This application Dec. 24, 1987, Ser. No. 137,698

Claims priority, application Japan, Nov. 20, 1986, 61-276927; Dec. 26, 1986, 61-314245; May 30, 1987, 62-135805

Int. Cl.[4] C08L *37/00, 33/02*

U.S. Cl. 525—74 **6 Claims**

1. A melt-blended resin composition consisting essentially of:

(a) 5 to 95% by weight of a resin containing at least one epoxy group per molecule and having a modulus of elasticity in bending measured according to ASTM D790 of at most 10^4 kg/cm^2 at room temperature, and

(b) 95 to 5% by weight of a copolymer of an α- olefin and an α,β-unsaturated carboxylic acid wherein at least 5% by mole of the carboxyl groups are neutralized with an alkali metal and which has a modulus of elasticity in bending measured according to ASTM D790 of at most 10^4 kg/cm^2 at room temperature.

4,898,912

COMPATIBLE POLYMER BLENDS

Werner Siol, Darmstadt, and Ulrich Terbrack, Reinheim, both of Fed. Rep. of Germany, assignors to Rohm GmbH Chemische Fabrik, Darmstadt, Fed. Rep. of Germany

Filed Sep. 15, 1987, Ser. No. 96,472

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1986, 3632369

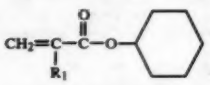
Int. Cl.[4] C08L *27/12, 35/00, 45/00*

U.S. Cl. 525—199 **25 Claims**

1. A miscible polymer blend, consisting essentially of:

(i) 0.1–99.9 wt.% of a first polymer comprising at least 90 wt.% and up to 100 wt.% of styrene monomer units; and

(ii) 99.9–0.1 wt.% of a second polymer comprising at least 10 wt.% and up to 100 wt.% of of monomer units of the formula (I)



(I)

wherein R_1 is hydrogen or methyl.

4,898,913

METHOD OF MAKING HYDROPHOBIC COPOLYMERS HYDROPHILIC

Maris J. Ziemelis, and William R. R. Park, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Apr. 7, 1989, Ser. No. 334,501

Int. Cl.[4] C08F *267/02, 265/02*

U.S. Cl. 525—301 **11 Claims**

1. A method for altering a macroporous highly cross-linked hydrophobic copolymer, produced by precipitation polymerization in a solvent of at least one monounsaturated ester monomer and at least one polyunsaturated ester monomer soluble therein, in order to render the hydrophobic copolymer hydrophilic, comprising polymerizing an acrylate monomer on the surface of the hydrophobic copolymer in order to form carboxylic acid sites on the surface of the hydrophobic copolymer.

4,898,914

MODIFIED BLOCK COPOLYMERS FUNCTIONALIZED IN THE MONOALKENYL AROMATIC OR VINYLARENE BLOCK

William P. Gergen, Houston, and Robert G. Lutz, Spring, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 766,217, Aug. 16, 1985. This application May 16, 1988, Ser. No. 194,670

Int. Cl.[4] C08L *53/02*

U.S. Cl. 525—314 **12 Claims**

1. A functionalized selectively hydrogenated block copolymer of the formula $B_n(AB)_oA_p$ where n=0 or 1, o=1 to 50, p=0 or 1, each A is predominantly a polymerized monoalkenyl aromatic or vinylarene hydrocarbon block and each B prior to hydrogenation is predominantly a polymerized conjugated diene hydrocarbon block, to which has been grafted at least one ethylene oxide molecule, wherein substantially all of the grafted molecules are grafted to the block copolymer in the monoalkenyl aromatic or vinylarene block.

4,898,915

ALTERNATING COPOLYMERIZATION OF DONOR MONOMERS HAVING PROTECTED AMINE GROUPS WITH ACCEPTOR MONOMERS

H. James Harwood, Stow; Ramendra N. Majumdar, Akron, both of Ohio, and Shih-Liang Yang, Pamona, Calif., assignors to University of Akron, Akron, Ohio

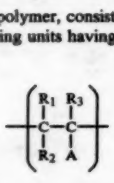
Filed Aug. 24, 1983, Ser. No. 525,953

Int. Cl.[4] C08F *18/22, 20/52*

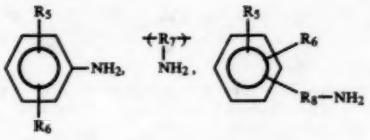
U.S. Cl. 525—326.7 **5 Claims**

1. An alternating copolymer, consisting of:

substantially alternating units having the formula



and units that are selected from the amine group containing units consisting of

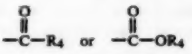


and combinations thereof, some of said amine groups containing protected amine groups thereon,

where R_1, R_2 and R_3 can be the same or different and are selected from the group consisting of hydrogen, a halogen, an alkyl having from 1 to 6 carbon atoms, an aryl having from 6 to 15 carbon atoms, and alkyl substituted aryl having from 7 to 15 carbon atoms, and an acid or ester of the formula

where R' is hydrogen, or an alkyl having from 1 to 20 carbon atoms;

where A is a nitrile group, or



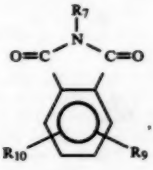
where R_4 is hydrogen, an alkyl having from 1 to 20 carbon atoms, an aryl having from 6 to 19 carbon atoms, an alkyl substituted aryl having from 6 to 20 carbon atoms, a halogen substituted phenyl having from 1 to 5 halogens thereon, a substituted aryl having from 6 to 20 carbon atoms with said substituted group being alkoxy, aryloxy, nitrilo, nitro, carboxyl, or a carboxylic acid ester group,

where R_5 and R_7 each represents a substituted ethylene group having from 2 to 6 carbon atoms,

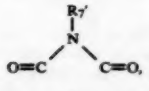
where R_6 is hydrogen, an alkyl having from 1 to 10 carbon atoms, a halogen, an alkoxy having from 1 to 10 carbon atoms or an aryloxy having from 6 to 20 carbon atoms, and

where R_8 is an alkylene having from 2 to 6 carbon atoms or an alkylene arylene having from 7 to 15 carbon atoms, said alternating unit contains protected amino groups therein being made from a compound having the formula selected from

Formula XI(a)



Formula XI(b)



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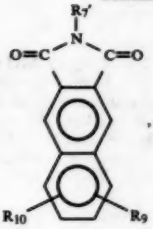
Formula XI(c)



where R_9 and R_{10} each represents a hydrogen, an alkyl having from 1 to 8 carbon atoms, an aryl having from 6 to 20 carbon atoms, an alkoxy having from 1 to 8 carbon atoms, an aryloxy having from 6 to 20 carbon atoms, or a halogen; and

wherein said R_{11} is a hydrogencarbon having from 1 to 18 carbon atoms using one specie thereof which has been reacted with a basic compound.

4,898,916

PROCESS FOR THE PREPARATION OF POLY(VINYLPHENOL) FROM POLY(ACETOXYSTYRENE) BY ACID CATALYZED TRANSESTERIFICATION

Balaram B. G. Gupta, North Plainfield, N.J., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Continuation of Ser. No. 22,186, Mar. 5, 1987, abandoned. This application Aug. 8, 1988, Ser. No. 231,582

The portion of the term of this patent subsequent to Aug. 25, 2004, has been disclaimed.

Int. Cl.[4] C08F *8/12*

U.S. Cl. 525—344 **11 Claims**

1. A process for converting polymers of 4-acetoxystyrene to polymers of 4-vinylphenol which comprises:

a. forming a slurry of the polymer of 4-acetoxystyrene in an alcohol;

b. adding an acid to the slurry;

c. holding the slurry at a temperature of about 20° C. to about 65° C. until the polymer dissolves in the alcohol, indicating complete conversion of the acetoxy groups to phenolic groups;

d. adding a base in an amount sufficient to raise the pH to about 5 to about 7; and

e. recovering the 4-vinylphenol polymer.

4,898,917

N-SUBSTITUTED POLYBENZIMIDAZOLE POLYMER

Michael J. Sansone, Berkeley Heights, N.J., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Continuation-in-part of Ser. No. 99,431, Sep. 11, 1987, abandoned. This application Sep. 21, 1988, Ser. No. 247,132

Int. Cl.[4] C08G *73/18*

U.S. Cl. 525—420 **23 Claims**

1. A process for the production of substituted polybenzimidazole polymers which comprises the following steps:

a. preparing a polybenzimidazole polymer solvent solution;

b. forming a polybenzimidazole anion from the polybenzimidazole polymer in solution; and

c. reacting the polybenzimidazole anion with a substituted methyl halide having the general formula of R—CH_2X, wherein R is selected from the group consisting of hydrogen, unsubstituted and substituted alkyl, unsubstituted and substituted alkenyl, and unsubstituted and substituted aryl groups wherein the substituents are selected from methyl, ethyl, pyridyl, halo, cyano, or nitro and wherein X is a halide substituent selected from the group consisting of

chloro, bromo, and iodo, to produce an N-substituted polybenzimidazole polymer.

4,898,918

THERMOPLASTIC RESIN COMPOSITION

Naoki Yamamoto; Hiroshi Mori, both of Hiroshima; Akira Nakata, Otake, and Misayo Suehiro, Hiroshima, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Sep. 30, 1988, Ser. No. 251,464

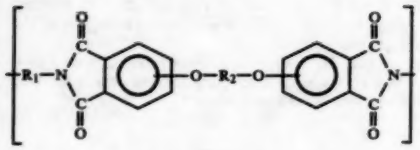
Claims priority, application Japan, Oct. 1, 1987, 62-245921

Int. Cl.[4] C08F *283/04*

U.S. Cl. 525—425 **11 Claims**

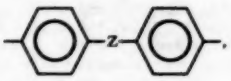
1. A thermoplastic resin composition, comprising:

(A) a polyether imide resin, consisting of recurring units having the formula (1)



(1)

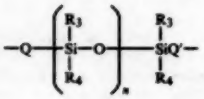
wherein R_1 and R_2 are, independently, a substituted or unsubstituted phenylene group, or a group having the formula



wherein Z is an oxygen atom, a sulfur atom,

or an alkylene group having 5 or less carbon atoms; and

(B) an aromatic polyester-polyorganosiloxane block copolymer, containing at least one polymer segment, comprising, as its main constituent, at least one segment selected from the group consisting of: (i) an aromatic polyester comprising monomer units derived from at least one aromatic dicarboxylic acid and at least one dihydric phenol; (ii) an aromatic polyester comprising monomer units derived from at least one aromatic dicarboxylic acid and at least one diol selected from lower aliphatic diols and alicyclic diols; and (iii) an aromatic polyester comprising monomer units derived from an aromatic hydroxycarboxylic acid; and polyorganosiloxane segments having the formula (2)



(2)

wherein R_3 and R_4 are, independently, methyl or phenyl groups, Q is an oxygen atom,

or —O—R_9— in which each of R_8 and R_9 is a lower alkylene group or a lower alkylene ether group; and Q' is an oxygen atom,

or —R_9—O—, wherein R_8 and R_9 are as defined above, and n is an integer of 10 or more, and wherein the weight ratio of (A) to (B) is 1/9 to 9/1.

4,898,919

POLYURETHANE ADHESIVE

Ryuichi Ueda, Ikeda; Masahito Mori, and Kohske Torii, both of Takatsuki, all of Japan, assignors to Sunstar Giken Kabushiki Kaisha, Osaka, Japan

Filed Jul. 22, 1988, Ser. No. 223,106

Claims priority, application Japan, Jul. 28, 1987, 62-189860; Jul. 31, 1987, 62-193127

Int. Cl.[4] C08L *75/06*

U.S. Cl. 525—440 **5 Claims**

1. A polyurethane adhesive which comprises

(a) a block polyurethane polyol produced by reacting a hydrogenated polybutadiene glycol, a polyol having two or more hydroxy groups in the molecule and a polyisocyanate,

(b) a thermoplastic polyester urethane rubber, and

(c) a polyisocyanate compound as a crosslinking agent.

4,898,920

ADHESIVE COMPOSITIONS, CONTROLLED RELEASE COMPOSITIONS AND TRANSDERMAL DELIVERY DEVICE

Chi-Long Lee, Midland, and Katherine L. Ulman, Sanford, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

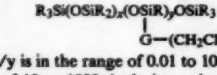
Filed Oct. 15, 1987, Ser. No. 109,157

Int. Cl.[4] C08F *77/04*

U.S. Cl. 525—477 **24 Claims**

1. An adhesive composition consisting essentially of a blend of

(A) about 10 to 99 wt. % of said composition of a random graft copolymer having the average formula



wherein x/y is in the range of 0.01 to 100, inclusive; x+y is in the range of 10 to 1000, inclusive; z is a number less than or equal to 15; R is selected from the group consisting of alkyl radicals having 1 to 8 carbon atoms, aryl radicals and haloalkyl radicals; all R groups can be the same or different; M is H, —COCH=CH_2, or —CO—NH(CH_2.)$_2$—O—CO—C(CH_3)=CH_2; G is a divalent radical selected from —$CH_2CH_2CH_2O$—, —CH_2CH_2O—, or urethane groups; and

(B) correspondingly 1 to 90 wt. % of a random resinous copolymer consisting essentially of structural units having the formulae $R^3_3SiO_{0.5}$ and SiO_2 wherein R^3 is a monovalent hydrocarbon radical, said resinous copolymer having an SiOH functionality of at least about 0.5 wt. %.

4,898,921

CONDUCTING POLYMER FILMS, METHOD OF MANUFACTURE AND APPLICATIONS THEREFOR

Brian D. Humphrey, Cedar Grove; Marc L. Kasner, Kinnelon, and John L. Isidor, Upper Montclair, all of N.J., assignors to Montclair State College, Montclair, N.J.

Filed Jun. 3, 1987, Ser. No. 57,602
Int. Cl.[4] C08G *81/00, 83/00*
U.S. Cl. 527—300 30 Claims

1. A conducting polymer film comprising a polysaccharide matrix with intercalated, bonded conducting polymers selected from the group consisting of polypyrrole, polythiophene, polyaniline and their derivatives.

4,898,922

URETHANE RESINS

Hiroyuki Shiraki, Kobe, Japan, assignor to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Oct. 5, 1988, Ser. No. 253,863
Claims priority, application Japan, Oct. 12, 1987, 62-256886
Int. Cl.[4] C08G *18/32*
U.S. Cl. 528—60 5 Claims

1. A urethane resin having mercapto groups in a ratio of about 0.01 to 1 milli-equivalent/g which is prepared by reacting a polyhydroxy component with a polyisocyanate, the polyhydroxy component being a mixture which comprises

(1) a long chain diol having a molecular weight ranging from about 500 to 3000,

(2) a short chain glycol having a molecular weight ranging from about 60 to 400, and

(3) 3-mercapto-1,2-propane diol.

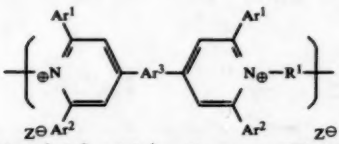
4,898,923

POLYPYRIDINIUM COPOLYMER

Alan R. Katritzky, Gainesville, Fla.; Larry R. Krepski, White Bear Lake, Minn.; Jerald K. Rasmussen, Stillwater, Minn.; Steven M. Heilmann, Afton, Minn., and Richard D. Tarr, Toledo, Ohio, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 126,590, Nov. 30, 1987, Pat. No. 4,841,021.
This application Mar. 1, 1989, Ser. No. 317,650
Int. Cl.[4] C08G *33/02*
U.S. Cl. 528—73 11 Claims

1. A copolymer comprising at least one dipyridinium unit having the formula:



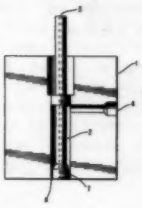
wherein Ar^1, Ar^2, and Ar^3 are the same or different aromatic or heteroaromatic group each of which contains one ring or two fused or catenated rings having 5 to 12 ring carbon or heteroatoms, R^1 is any divalent organic bridging group, and $Z^{\ominus}$ is a counterion, said copolymer further comprising copolymeric units derived from amine-reactive difunctional comonomers.

4,898,924

PROCESS FOR THE PRODUCTION OF BIAXIALLY ORIENTED RIGID ROD HETEROCYCLIC LIQUID CRYSTALLINE POLYMER FILMS

Edward C. Chenevey, North Plainfield, and Edward R. Kafchinski, Winfield, both of N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Jan. 11, 1989, Ser. No. 295,689
Int. Cl.[4] B29C *55/12, 55/28;* C08G *73/22, 75/32*
U.S. Cl. 528—183 26 Claims



1. A process for preparing a biaxially oriented film of a rigid rod heterocyclic liquid crystalline polymer comprising,

(i) providing a dope from a polymerization mixture of a rigid rod heterocyclic liquid crystalline polymer and a solvent;

(ii) extruding the dope to form a film;

(iii) imparting biaxial orientation to the film to increase the transverse strength thereof;

(iv) solidifying the biaxially oriented film; and

(v) washing the solidified film to remove the solvent.

4,898,925

ELASTOMERIC ACETAL POLYMERS

George L. Collins, Maplewood; Kurt F. Wissbrun, Short Hills, and Hongkyu Kim, Madison, all of N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Sep. 12, 1988, Ser. No. 243,381
Int. Cl.[4] C08G *2/10*
U.S. Cl. 528—230 5 Claims

1. An elastomeric copolymer of about 15 to 45 mol % of trioxane and about 55 to 85 mol % of 1,3-dioxolane based on the total of trioxane and 1,3-dioxolane, and about 0.005 to 0.15 wt.% of 1,4-butanediol diglycidyl ether or butadiene diepoxide as a bifunctional monome, based on the total weight of copolymer, said copolymer being substantially non-crystalline in the unstretched state at room temperature.

4,898,926

BIOELASTOMER CONTAINING TETRA/PENTA-PEPTIDE UNITS

Dan W. Urry, Birmingham, Ala., assignor to The University of Alabama at Birmingham/Research Foundation, Birmingham, Ala.

Filed Jun. 15, 1987, Ser. No. 62,557
Int. Cl.[4] C08G *69/10*
U.S. Cl. 528—328 4 Claims

1. A bioelastomer containing repeating units comprising elastomeric pentapeptide units or a mixture of tetrapeptide and pentapeptide units, wherein said repeating units comprise amino acid residues selected from the group consisting of hydrophobic amino acid residues and glycine residues, wherein said repeating units exist in β-turn which comprises a polypentapeptide unit of the formula:

—αPρΩG—

wherein

P is a peptide-forming residue of L-proline;

G is a peptide-forming residue of glycine;

α is a peptide-forming residue of L-valine, L-leucine, L-

isoleucine, L-phenylalanine or an ionizable peptide-forming residue selected from the group consisting of residues of L-Glu, L-Asp, L-His, L-Lys and L-Tyr and other ionizable pep-tide-forming L-amino acid residues.

Ω is a peptide-forming residue of L-valine, L-leucine, L-isoleucine, L-phenylalanine or an ionizable peptide-forming residue selected from the group consisting of residues of L-Glu, L-Asp, L-His, L-Lys, and L-Tyr and other ionizable peptide-forming L-amino acid residues; and

ρ is a peptide-forming residue of glycine or a peptide-forming residue of D-Glu, D-Asp, D-His, D-Lys and D-Tyr and other ionizable peptide-forming L-amino acid residues; and wherein n is an integer of from 1 to 5,000; with the proviso that in at least one repeating pentapeptide unit of said bicelastomer, at least one of said α or Ω is a peptide-forming residue selected from the group and L-Tyr and other ionizable peptide-forming L-amino acid residues, or ρ is a peptide-forming residue of glycine or a peptide-forming residue of D-Glu, D-Asp, D-His, D-Lys and D-Tyr and other ionizable peptide-forming L-amino acid residues.

4,898,927

NON-FUSIBLE POLYMER INSOLUBLE IN ORGANIC SOLVENTS FROM 1,3,5,7-TETRATHIA-S-INDACENE-2,6-DITHIONE

Max Hunziker, Dödingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

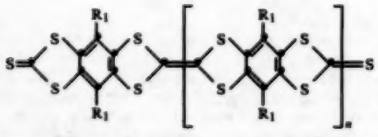
Filed Jul. 14, 1988, Ser. No. 218,768

Claims priority, application Switzerland, Jul. 24, 1987, 2825/87; Jul. 30, 1987, 2915/87

Int. Cl.[4] C08G 75/00

U.S. Cl. 528—377 **10 Claims**

1. A non-fusible polymer which is insoluble in organic solvents and essentially is of the formula I



(I)

in which n is 2 or a number greater than 2 and each radical R_1 independently is —H, C_1–C_{20}alkyl, C_1–C_{20}alkoxy, aryl or aryloxy with up to 12 C atoms, aralkyl with up to 20 C atoms, alkaryl with up to 20 C atoms, —CN, —$OCOR_2$, —OH or —SR_3, in which R_2 and R_3 independently of one another are each C_1–C_{20}alkyl or aryl with up to 12 C atoms.

4,898,928

POLYACETAL AND POLYKETAL HYDROGELS FORMED FROM ACETALS OR KETALS AND POLYOLS

Jorge Heller, Woodside; Donald W. H. Penhale, Menlo Park, and Steve Y. Ng, San Francisco, all of Calif., assignors to Sandoz Pharmaceuticals Corp., E. Hanover, N.J.

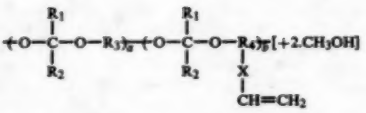
Filed Mar. 7, 1988, Ser. No. 164,604

The portion of the term of this patent subsequent to Dec. 15, 2004, has been disclaimed.

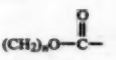
Int. Cl.[4] C08G 18/30

U.S. Cl. 528—392 **17 Claims**

1. Water-soluble polyacetal or polyketal having the formula



wherein R_1, and R_2 are aliphatic, cycloaliphatic or aromatic groups, for ketals; R_1 is hydrogen and R_2 is aliphatic, cycloaliphatic, or aromatic groups for acetals; R_3 and R_4 are also aliphatic, alkoxy, cycloaliphatic or aromatic groups X represents groups as $(CH_2)_n$, $O(CH_2)_nO$ or



that connect the pendant unsaturation to the aliphatic, cycloaliphatic or aromatic R^4 groups, the ratio of a to b is 0.5 to 10, and n is 10–100.

4,898,929

ALKENYL PHENOXY POLYFLUOROALKOXYPHOSPHAZENE

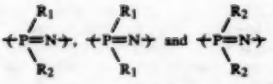
W. Dirk Klobucar; Charles H. Kolich, and Jeffrey T. Books, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Nov. 2, 1988, Ser. No. 265,991

Int. Cl.[4] C08G 79/02; C08F 6/02

U.S. Cl. 528—399 **21 Claims**

1. A Substantially linear organophosphazene polymer containing randomly distributed repeating units represented by the formulas:



wherein R_1 is a fluoroalkoxy group having the structure:

$$F_3C-(CF_2)_m-CH_2O-$$

wherein m is 0 or an integer from 1 to 20 and wherein at least 3 of the R_1 units are different from each other and R_2 represents a group with some alkenyl group unsaturation which enhances the curability of said polymers and represented by the formula:

wherein R_3 is an alkenyl monovalent group and R_4 is selected from the group consisting of H, alkyl and alkoxy, the total number of said units ranging from 3 to about 100,000 and the R_2 groups being present in an amount sufficient to enable the cure of said polymers and in the range of about 0.01–50 mole percent of the total number of R_1 and R_2 groups.

4,898,930

PEPTIDE DERIVATIVES AND PROCESSES FOR THEIR PREPARATION

Evzen Kasafirek; Miroslav Rybák; Ivan Krejci; Antonín Sturc; Alena Roubalová, all of Prague; Jirí Vanzura, Hradec Králové; Evzen Krepela, Brno, and Michal Bartík, Kosice, all of Czechoslovakia, assignors to Spofa, spojene podniky pro, Prague, Czechoslovakia

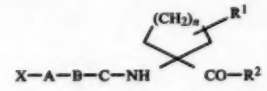
Filed Jun. 12, 1987, Ser. No. 62,300

Claims priority, application Czechoslovakia, Jun. 12, 1986, 4332-86

Int. Cl.[4] C07K 7/54

U.S. Cl. 530—332 15 Claims

1. Peptide derivatives of the general formula I,



in which

X is H, a C_2 to C_5 alkanecarbonyl, a C_3 to C_6 carboxyalkanecarbonyl or a p-toluenesulfonyl,

A is a glycine, alanine, leucine, phenylalanine, tyrosine, lysine or arginine residue,

B is a glutamine, proline, arginine or lysine residue or a direct chemical bond,

n is an integer of from 1 to 3, R^1 is H or a C_1 to C_3 alkyl and R^2 is a C_1 to C_3 alkoxyl or an amino group selected from the group consisting of glycine, alanine, leucine, phenylalanine and serine when C is a glycine, alanine, leucine, phenylalanine, glutamine or serine residue or

R^2 is a glycine, alanine, leucine, phenylalanine or serine methyl ester, ethyl ester or amide residue when C is a direct chemical bond, and pharmaceutically acceptable acid addition salts thereof.

4,898,931

NOVEL HUMAN INTERFERON-γ POLYPEPTIDE DERIVATIVE

Seiga Itoh, Sagamihara; Yasutoshi Takeichi, and Moriyuki Sato, both of Machida, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Jul. 10, 1985, Ser. No. 751,205

Claims priority, application Japan, Jul. 11, 1984, 59-143950

Int. Cl.[4] C07K 13/00, 15/26; A61K 45/02

U.S. Cl. 530—351 1 Claim

1. A derivative of human interferon-γ polypeptide comprising an amino acid sequence in which nine amino acid residues have been removed from the carboxy terminus thereof, the methionine residue at position 137 has been replaced with a cysteine and the amino acid at positions 1 and 3 may be serine or cysteine and which is encoded by a recombinant plasmid selected from the group consisting of pGVT137, pGNC5 and pGNB4.

4,898,932

MONOCLONAL ANTIBODIES REACTIVE WITH ACTIVATED AND ONCOGENIC RAS P21 PROTEINS

Walter P. Carney, Brighton, Mass., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 913,905, Oct. 1, 1986, abandoned, and a continuation-in-part of Ser. No. 696,197, Jan. 19, 1985, abandoned. This application Oct. 22, 1987, Ser. No. 111,315

Int. Cl.[4] C07K 15/00; C12N 5/00

U.S. Cl. 530—387 13 Claims

1. A monoclonal antibody which binds specifically to an epitope of an activated ras protein containing valine at position 12 and does not bind to an epitope of normal nononcogenic ras protein containing glycine at position 12, wherein said epitope of the activated ras protein also is bound by a monoclonal antibody produced by hybridoma cell line having ATCC Accession No. HB 8698.

4,898,933

WATER-SOLUBLE FIBER-REACTIVE AMINOTRIAZINE AND VINYLSULFONE CONTAINING AZO DYESTUFFS HAVING CARBOXY- OR CARBAMOYL PYRIDINIUM GROUPS

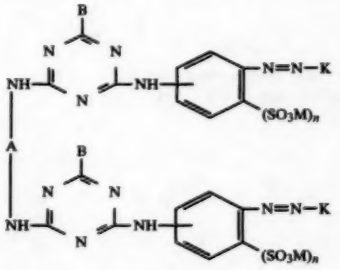
Ludwig Schläfer, Kelkheim; Hartmut Springer, and Reinhard Hähnle, both of Königstein/Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 115,435, Oct. 30, 1987, Pat. No. 4,861,344. This application May 5, 1989, Ser. No. 348,276

Int. Cl.[4] C09B 62/453, 62/09, 62/513; D06P 1/38

U.S. Cl. 534—605 4 Claims

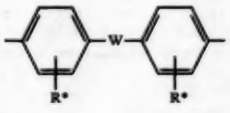
1. A water-soluble azo compound which conforms to the formula



in which

A is phenylene unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of alkoxy of 1 to 4 carbon atoms, alkyl of 1 to 4 carbon atoms, chlorine, sulfo and carboxy, or

A is a group of the formula

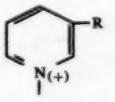


in which

W is a direct bond or a vinylidene group of the formula —CH=CH— or a group of the formula —NH—CO—NH— and

R* is hydrogen or nitro, sulfo, carboxy, methyl, ethyl, methoxy or ethoxy;

B is a pyridinium group of the formula



(3)

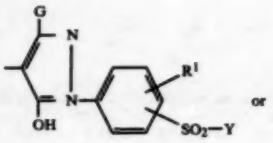
in which

R is carboxy or carbamoyl;

n is zero or 1;

M is hydrogen or an alkali metal;

K is a group of the formula



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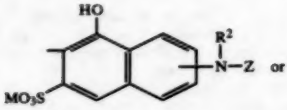

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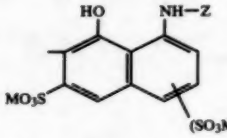
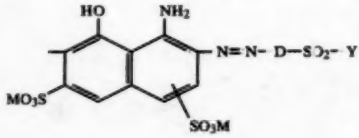


the one —SO_3M group being bonded in the meta- or para-position relative to the —NH—Z group

or is



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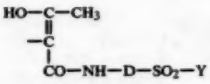


in which

D is phenylene unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of chlorine, bromine, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, carboxy and sulfo, or is naphthylene unsubstituted or substituted by 1 or 2 sulfos;

R^1 is hydrogen, chlorine, alkyl group of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms;

R^2 is hydrogen or alkyl of 1 to 4 carbon atoms;

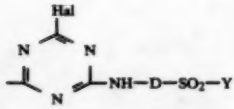
G is carboxy, methyl or carbalkoxy of 2 to 5 carbon atoms;

Y is a vinyl, β-sulfatoethyl or β-chloroethyl;

M has the abovementioned meaning;

m is zero or 1;

Z is α- or β-bromoacryloyl or is β-chloropropionyl, β-chloroethylsulfonylbenzoyl or (β-chloroethylsulfonylmethyl)-benzoyl or a group of the formula



in which D and Y have the abovementioned meanings and Hal is chlorine or fluorine;

one of the sulfo, sulfato and carboxy groups forms an anion equivalent to the pyridinium cation.

4,898,934

PROCESS FOR MANUFACTURING LIGHT-COLORED ALKYLOLIGOGYCOSIDES AND ALKYLGLYCOSIDES

Harald Lueders, Recklinghausen, and Peter Hofmann, Marl, both of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Sep. 6, 1988, Ser. No. 240,594

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1987, 3729843

Int. Cl.[4] C07G 3/00, 17/00, 11/00; C07H 15/04

U.S. Cl. 536—18.6 **12 Claims**

1. A process for manufacturing light-colored alkyloligoglycosides and alkylglycosides having C_{8-24} alkyl groups from saccharides and alcohols, comprising the steps of:

(i) reacting at least one saccharide with a C_{1-6} alcohol to prepare a C_{1-6} alkylglycoside or alkyloligoglycoside;

(ii) reacting said C_{1-6} alkylglycoside or alkyloligoglycoside with a C_{8-24} alcohol at an elevated temperature of 80° to 140° C. and in the presence of an acid catalyst, wherein a complex-forming agent selected from the group consisting of alkali salts of phosphoric acid, polyphosphoric acid, hydrofluoric acid, and hydrocyanic acid and polybasic saturated carboxylic acids, an alkali salt thereof of a methyl or ethyl ester thereof is present during one or both of steps (i) and (ii), to produce a product solution containing said C_{8-24} alkyloligoglycoside or alkylglycoside;

(iii) separating said C_{8-24} alkyloligoglycoside or alkylglycoside from said product solution; and

(iv) bleaching said C_{8-24} alkyloligoglycoside or alkylglycoside with a peroxide compound.

4,898,935

METHOD OF PRODUCING SUCROSE FATTY ACID ESTER GRANULES

Shingo Nakamura, Kyoto, and Hiroshi Nagahara, Osaka, both of Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Filed Jan. 17, 1989, Ser. No. 297,806

Claims priority, application Japan, Jan. 22, 1988, 63-6313247

Int. Cl.[4] C07H 13/02, 11/00

U.S. Cl. 536—119 **1 Claim**

1. A method of producing sucrose fatty acid ester granules by the fluidized bed granulation and drying technique which comprises forming a fluidized bed comprising a sucrose fatty acid ester powder at a temperature not exceeding 60° C., spraying the fluidized bed with an aqueous sucrose fatty acid ester solution having a concentration of 3–20% by weight, as a binder, and then drying the sprayed fluidized bed, to thereby cause granulation.

4,898,936

2-DEOXYURIDINES AND RIBOSIDE PRECURSORS

James E. Ollmann, and Ralph J. DePasquale, both of Jacksonville, Fla., assignors to PCR, Inc., Gainesville, Fla.

Continuation-in-part of Ser. No. 653,451, Sep. 24, 1984, abandoned. This application Sep. 19, 1985, Ser. No. 777,701

Int. Cl.[4] C07H 19/073, 11/00, 23/00

U.S. Cl. 536—17.1 **5 Claims**

2. Methyl 3-O-benzyl-5-O-(t-butyldimethylsilyl)-2-deoxy-ribofuranoside.

5. The alpha-3'-O-benzyl-2'-deoxy-5-trifluoromethyl-uridine.

4,898,937

α-CRYSTALS OF CEFAZOLIN SODIUM

Toshinobu Uemura, Kishiwada; Keiji Kai, Osaka; Masateru Kodani, Ikeda; Fumiyo Yoshida, Osaka, and Matsuhiko Aratani, Daito, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Feb. 2, 1989, Ser. No. 305,167

Claims priority, application Japan, Feb. 5, 1988, 63-26337

Int. Cl.[4] C07D *501/56;* A61K *31/545*

U.S. Cl. 540—227 **2 Claims**

1. α-Crystals of cefazolin sodium with a water content in the range of 13.0 to 15.8 percent.

4,898,938

METHOD FOR PREPARING CRYSTALLINE CEFADROXIL MONOHYDRATE

Leonardo Marsili, Segrate, Italy, assignor to Rifar S.r.L., Milan, Italy

Filed Aug. 3, 1987, Ser. No. 80,999

Int. Cl.[4] C07D *501/22;* A61K *31/545*

U.S. Cl. 540—230 **2 Claims**

1. A method for preparing crystalline cefadroxil monohydrate which comprises slurrying a cefadroxil solvate with isopropyl alcohol containing from about 6% to about 18% of water, at a temperature in the range of about +45° C. to +55° C. for a time of about 1 to 2 hours, and isolating the crystalline cefadroxil monohydrate by filtration.

4,898,939

PROCESS FOR PREPARING 2β-SUBSTITUTED-METHYLPENICILLIN DERIVATIVES

Sigeru Torii; Hideo Tanaka; Motoaki Tanaka, all of Okayama; Shozo Yamada, Houjyo, and Akira Nakai, Okayama, all of Japan, assignors to Taiho Pharmaceutical Co., Ltd., Tokyo and Otsuka Kagaku Kabushiki Kaisha, Osaka, both of, Japan

Filed Feb. 28, 1989, Ser. No. 316,632

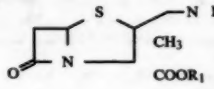
Claims priority, application Japan, Mar. 1, 1988, 63-49038

Int. Cl.[4] C07D *499/00*

U.S. Cl. 540—310 **9 Claims**

1. A process for preparing a 2β-substituted-methylpenicillin derivative represented by the formula

(I)

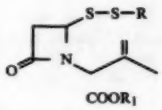


wherein

is pyrazolyl, imidazolyl, 1,2,3-triazolyl, 1,2,4-triazolyl, tetrazolyl, benzotriazolyl, benzopyrazolyl or benzimidazolyl each of which may have 1 to 3 substituents selected from the class consisting of C_1–C_6 straight- or branched-chain alkyl group, C_1–C_6 straight- or branched-chain alkoxy group, C_2–C_6 acyl group, carbamoyl group, C_1–C_6 alkyl-substituted carbamoyl group, halogen atom, hydroxy group, trifluoromethyl group, nitro group, amino group, formyl group, C_1–C_6 alkoxy-C_1–C_6 alkyl group, C_2–C_7 alkoxycarbonyl group, C_3–C_7 alkenyloxycarbonyl group, benzyloxycarbonyl group which may optionally have 1–3 substituents selected from the group consisting of C_1–C_6 alkyl group, a halogen atom and nitro group on the benzene ring, phenyl group which may optionally have 1–3 substituents selected from the group consisting of C_1–C_6 alkyl group, C_1–C_6 alkoxy group and halogen atom on the benzene ring, C_1–C_6 alkyl groups substituted with 1–3 phenyl groups, C_1–C_6 alkylthio group, C_1–C_6 alkylsulfinyl group and C_1–C_6 alkylsulfonyl group, and R_1 is a penicillin carboxyl protecting group selected from the group consisting of methyl, ethyl, propyl, butyl, tert-butyl, 1,1-dimethylpropyl, 1-cyclopropylmethyl, 2-cyano-1,1-dimethylethyl, bromobenzoylmethyl, p-nitrobenzoylmethyl, dimethylaminomethyl, methylthiomethyl, phenylthiomethyl, succinimidomethyl, trichloroethyl, tribromoethyl, 1,1-dimethyl-2-propenyl, 1,3-dimethyl-3-butenyl, benzyl, diphenylmethyl, trityl, p-nitrobenzyl, p-methoxybenzyl, di(p-methoxyphenyl)methyl, acetoxymethyl, acetoxyethyl, propionyloxyethyl, pivaloyloxymethyl, pivalolyloxyethyl, pivaloyloxypropyl, benzoyloxymethyl, benzoyloxyethyl, benzylcarbonyloxymethyl, cyclohexylcarbonyloxymethyl, methoxymethyl, ethoxymethyl, benzyloxymethyl, 3-phthalidyl, crotonolacton-4-yl, tetrahydropyranyl, dimethylchlorosilyl, trichlorosilyl, pyridine-1-oxide-2-methyl and quinoline-1-oxide-2-methyl, which comprises

reacting an azetidinonedisulfide compound of the formula

(III)



wherein R_1 is as defined above, and R is a 5- or 6-membered heterocyclic group, which contains 1 to 4 nitrogen atoms and may further contain one oxygen or sulfur atom as the heteroatom in the ring structure, and which may optionally be fused with a benzene ring, and which may optionally have 1 to 3 substituents, selected from the group consisting of C_1–C_4 alkyl, C_1–C_4 alkoxy halogen atom, nitro, phenyl, tolyl, xylyl, benzyl, phenethyl and trityl, with a nitrogen-containing heterocyclic compound of the formula

(IV)

wherein

is as defined above, in a solvent and in the presence of a metal compound which is an organic carboxylic acid salt, carbonate or oxide of silver, mercury, cerium, copper, lead or thallium, wherein the metal compound is used in an amount of about 1.5 to 5 moles per mole of the compound of the formula (III), the compound of the formula (IV) is used in an amount of about 2 to 20 moles per mole of the compound of the formula (III), and the reaction is carried out at a temperature of about 20° to 100° C.

4,898,940

PEPTIDE ANTIBIOTICS

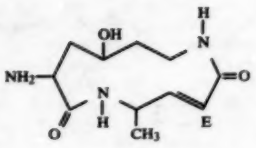
Masataka Konishi, Kawasaki; Koji Tomita, Setagaya; Masahisa Oka, Yokohama, and Ken-ichi Numata, Tokyo, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 51,433, May 19, 1987, Pat. No. 4,833,076, which is a continuation-in-part of Ser. No. 771,090, Aug. 30, 1985, abandoned. This application Feb. 13, 1989, Ser. No. 309,527

Int. Cl.[4] C07D *241/02*

U.S. Cl. 540—460 **1 Claim**

1. A compound of the formula



4,898,941

PROCESS FOR PREPARING DIPHENYLALKENE DERIVATIVES

Nobuo Kanda, Hirakata; Haruo Omura, Osaka; Yukihiro Abe, Nishinomiya, and Mitsuru Kondo, Hyogo, all of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

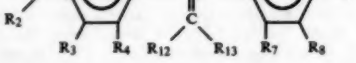
Filed Aug. 11, 1987, Ser. No. 83,815

Claims priority, application Japan, Aug. 22, 1986, 61-197622; Dec. 12, 1986, 61-297276

Int. Cl.[4] C07D 471/06, 223/04, 209/44; C07C 85/24

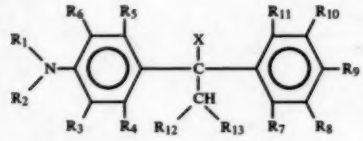
U.S. Cl. 540—596 11 Claims

1. A process for preparing a diphenylalkene derivative of formula (II)



(II)

which comprises oxidizing a diphenylalkanoic acid derivative of formula (I)



(I)

wherein

each of R_1 and R_2 is selected independently from the group consisting of C_{1-8} alkyl; C_{2-4} alkyl substituted with C_{1-4} alkoxyl; C_{2-4} alkyl substituted with halogen atom; C_{3-9} alkenyl; C_{3-9} alkynyl; C_{5-12} cycloalkyl; phenyl-C_{1-4} alkyl unsubstituted or substituted with halogen atom, C_{1-4} alkyl or C_{1-4} alkoxyl; phenyl unsubstituted or substituted with halogen atom, C_{1-4} alkyl or C_{1-4} alkoxyl; or R_1 and R_2 form together with the nitrogen atom to which R_1 and R_2 are attached, or together with said nitrogen atom and the phenyl ring to which said nitrogen atom is attached, a heteroring selected from the group consisting of pyrrolidine, piperidine, morpholine, hexamethyleneimine, isoindoline, tetrahydroquinoline, indoline and julolidine,

each of R_3 to R_{11} is independently selected from the group consisting of hydrogen atom; halogen atom; C_{1-4} alkyl; C_{1-4} alkoxyl; phenoxy unsubstituted or substituted with halogen atom, C_{1-4} alkyl or C_{1-4} alkoxyl; and the amino group $—N(R_{17})(R_{18})$ wherein each of R_{17} and R_{18} is independently selected from the group consisting of hydrogen atom; C_{1-8} alkyl; C_{2-4} alkyl substituted with C_{1-4} alkoxyl; C_{2-4} alkyl substituted with halogen atom; C_{3-9} alkenyl; C_{3-9} alkynyl; C_{5-12} cycloalkyl; C_{1-4} acyl; phenyl-C_{1-4} alkyl unsubstituted or substituted with halogen atom, C_{1-4} alkyl or C_{1-4} alkoxyl; and phenyl unsubstituted or substituted with halogen atom, C_{1-4} alkyl or C_{1-4} alkoxyl, provided that R_{17} and R_{18} are not hydrogen atoms simultaneously, and R_{17} and R_{18} may form together with the nitrogen atom to which R_{17} and R_{18} are attached, or together with said nitrogen atom and the phenyl ring to which said nitrogen atom is attached, a heteroring selected from the group consisting of pyrrolidine, piperidine, morpholine, hexamethyleneimine, isoindoline, tetrahydroquinoline, indoline and julolidine,

each of R_{12} and R_{13} is independently hydrogen atom or C_{1-4} alkyl,

X is carboxyl, or an amide, ester or halide thereof,

said oxidation being conducted at a temperature in the range of from −5° C. to 150° C., in a solvent which is at least one member selected from the group consisting of water and an inert organic solvent, and in the presence of an oxidizing agent selected from the group consisting of lead dioxide, lead tetraacetate, ferric chloride, potassium persulfate, sodium persulfate, ammonium persulfate and hydrogen peroxide.

4,898,942

PROCESS FOR MANUFACTURING DIAZINON

David Ovadia, Omer, and Ernestine Mandler, Beer-Sheva, both of Israel, assignors to Makhteshim Chemical Works, Ltd., Beer Sheva, Israel

Continuation of Ser. No. 917,195, Oct. 19, 1986, abandoned. This application Aug. 30, 1988, Ser. No. 239,341

Claims priority, application Israel, Oct. 14, 1985, 76705

Int. Cl.[4] C07F 9/65

U.S. Cl. 544—243 11 Claims

1. An improved process for preparing diazinon by reacting the sodium or potassium salt of 2-isopropyl-4-methyl-6-hydroxypyrimidine with diethylthiophosphoryl chloride the improvement which comprises mixing 2-isopropyl-4-methyl-6-hydroxypyrimidine with solid sodium or potassium hydroxide in a ketone or ether solvent at a temperature of about 50°–60° C. until a homogeneous mixture is formed, adding diethylthiophosphoryl chloride to this homogeneous mixture, keeping the mixture at a temperature of 55°–80° C. until the reaction is complete, and separating the diazinon formed.

4,898,943

TRICYCLIC TRIAZOLOPYRIMIDINE DERIVATIVES

Sumiro Isoda; Shunzo Aibara; Tamotsu Miwa; Hiroyuki Fujiwara; Shuichi Yokohama, and Hiroo Matsumoto, all of Tokyo, Japan, assignors to Daiichi Seiyaku Co., Ltd., Tokyo, Japan

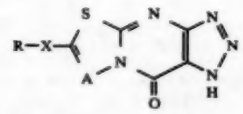
Filed Feb. 8, 1988, Ser. No. 153,677

Claims priority, application Japan, Feb. 6, 1987, 62-25853; Mar. 30, 1987, 62-77344

Int. Cl.[4] C07D 513/14; A61K 31/52

U.S. Cl. 544—251 15 Claims

1. A compound represented by formula (I)



(I)

where A represents

or =N—; A' represents a hydrogen atom, an alkyl group or a halogen-substituted alkyl group having 1 to 6 carbon atoms; R represents a cycloalkyl group having 4 to 14 carbon atoms which may be substituted with one or more alkyl groups, having 1 to 6 carbon atoms; and X represents a single bond, or

an alkylene group having 1 to 10 carbon atoms or an alkenylene group having 2 to 10 carbon atoms, each of which may be substituted with one or more substituents selected from the group consisting of an alkoxy group having 1 to 6 carbon atoms and a halogen atom, and physiologically acceptable salts thereof.

4,898,944

PRECURSORS FOR THE PREPARATION OF WATER-SOLUBLE TRIPHENDIOXAZINE DYESTUFFS

Günther Schwaiger, Frankfurt am Main; Hartmut Springer, Königstein/Taunus, and Walter Helmling, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

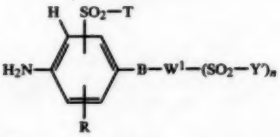
Division of Ser. No. 909,010, Sep. 18, 1986, Pat. No. 4,786,728. This application Oct. 27, 1988, Ser. No. 263,613

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1985, 3533411; Jul. 26, 1987, 3625347

Int. Cl.[4] **C07C** *147/103, 147/107, 147/12*

U.S. Cl. 544—337 **10 Claims**

1. A compound of the formula (4)



(4)

in which:

Y′ is vinyl, β-hydroxyethyl or an ethyl group which contains, in the β-position, a substituent which is eliminated by an alkali;

R is a hydrogen atom or alkyl with 1 to 6 carbon atoms, alkoxy with 1 to 5 carbon atoms, halogen, carboxy, or sulfo;

n is the number 1 or 2;

T is alkyl of 1 to 6 carbon atoms with may be interrupted by 1 or 2 hetero groups selected from the group consisting of —O—, —S—, —NH—, and —N(R′)—, the alkyl group T is unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of chlorine, alkoxy of 1 to 4 carbon atoms, benzylamino, sulfobenzoylamino, alkanoylamino of 2 to 5 carbon atoms, hydroxy, sulfato, phosphato, acetoxy, sulfo, carboxy and phenyl unsubstituted or substituted by substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms and sulfo, but with the exclusion of substituents which conform to said group Y′, or

T is phenyl or naphthyl, or is phenyl or naphthyl both of which are substituted by substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, sulfo, carboxy, carbamoyl unsubstituted or monosubstituted or disubstituted by phenyl, alkyl of 1 to 4 carbon atoms, phenylalkyl with an alkyl of 1 to 4 carbon atoms and/or cycloalkyl of 5 to 8 carbon atoms, sulfamoyl unsubstituted or monosubstituted or disubstituted by phenyl, alkyl of 1 to 4 carbon atoms, phenylalkyl with an alkyl of 1 to 4 carbon atoms and/or cycloalkyl of 5 to 8 carbon atoms, trifluoromethyl, benzoylamino, sulfobenzoylamino, alkanoylamino of 2 to 5 carbon atoms, nitro and amino unsubstituted or monosubstituted or disubstituted by phenyl, alkyl of 1 to 4 carbon atoms, phenylalkyl with an alkyl of 1 to 4 carbon atoms and/or cycloalkyl of 5 to 8 carbon atoms;

B is an oxygen or sulfur atom or an amino group of the formula —NH— or —N((R′)—, and

R′ of formula —N(R′)— in said definition of T and B is alkyl of 1 to 6 carbon atoms unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of chlorine, alkoxy of 1 to 4 carbon atoms, benzoylamino, sulfobenzoylamino, alkanoylamino of 2 to 5 carbon atoms, hydroxy, sulfato, phosphato, acetoxy, sulfo, carboxy and phenyl unsubstituted or substituted by substituents selected from alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms and sulfo;

W^1 is alkylene of 1 to 6 carbon atoms which may be interrupted by 1 or 2 hetero groups which are selected from groups of the formulae 'O—, —S—, —SO_2—, —CO—, 1,4-piperidino, —NH— and —N(R^o)— in which R^o has one of the meanings of R′ or is alkanoyl of 2 to 5 carbon atoms, and the alkylene W^1 is unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of chlorine, alkoxy of 1 to 4 carbon atoms, benzoylamino, sulfobenzoylamino, alkanoylamino of 2 to 5 carbon atoms, hydroxy, sulfato, phosphato, acetoxy, sulfo, carboxy and phenyl unsubstituted or substituted by substituents selected from alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms and sulfo, or

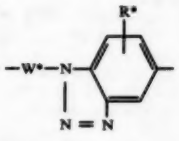
W^1 is an alkylene-phenylene, phenylene-alkylene, phenylene-alkylene-phenylene or alkylene-phenylene-alkylene group, the alkylene moieties of which are of 1 to 6 carbon atoms unsubstituted or substituted by 1 or 2 substituents selected from chlorine, alkoxy of 1 to 4 carbon atoms, benzoylamino, sulfobenzylamino, alkanoylamino of 2 to 5 carbon atoms, hydroxy, sulfato, phosphato, acetoxy, sulfo, carboxy and phenyl unsubstituted or substituted by substituents selected from alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms and sulfo, and interrupted or non-interrupted by 1 or 2 hetero groups selected from those mentioned above, and the phenylene moieties of which are unsubstituted or substituted by 1 or 2 substituents selected from the group of substituents consisting of sulfo, carboxy, sulfamonyl carbamoyl, methyl, ethyl, methoxy, ethoxy, nitro, chlorine, amino and amino substituted by alkyl of 1 to 4 carbon atoms, phenyl and/or phenylalkyl with an alkyl of 1 to 4 carbon atoms, or

W^1 is phenylene or naphthylene, or phenylene or naphthylene both of which are substituted by substituents selected from alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, sulfo, carboxy, sulfamoyl, carbamoyl, carbamoyl which is mono- or disubstituted by alkyl of 1 to 4 carbon atoms, phenyl, phenylalkyl with an alkyl of 1 to 4 carbon atoms and/or cycloalkyl of 5 to 8 carbon atoms, sulfamoyl which is mono- or disubstituted by alkyl of 1 to 4 carbon atoms, phenyl, phenylalkyl with an alkyl of 1 to 4 carbon atoms and/or cycloalkyl of 5 to 8 carbon atoms, trifluoromethyl, benzoylamino, sulfobenzoylamino, alkanoylamino of 2 to 5 carbon atoms, nitro, amino and amino mono- or di-substituted by alkyl of 1 to 4 carbon atoms phenyl, phenylalkyl with an alkyl of 1 to 4 carbon atoms and/or cycloalkyl of 5 to 8 carbon atoms, or

W^1 is one of the above-mentioned alkylene and arylene moieties which are connected with one another by one of the above-mentioned hetero groups, or

W^1 is a cycloalkylene of 5 to 10 carbon atoms unsubstituted or substituted by alkyl of 1 to 4 carbon atoms, or is an alkylene-cycloalkylene or cycloalkylene-alkylene or alkylene-cycloalkylene-alkylene the alkylene moieties of which are of 1 to 4 carbon atoms and the cycloalkylene moities of which are of 5 to 8 carbon atoms and may be substituted by alkyl of 1 to 4 carbon atoms, or

W^1 is a group of the formula



in which

R^* is hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, carboxy or sulfo, and

W* is alkylene of 1 to 6 carbon atoms which may be interrupted by 1 or 2 hetero groups which are selected from groups of the formulae —O—, —S—, —SO_2—, —CO—, 1,4-piperidino, —NH— and —N(R^o)— in which R^o has one of the meanings of R' —CO—, or is alkanoyl of 2 to 5 carbon atoms, and the alkylene W* is unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of chlorine, alkoxy of 1 to 4 carbon atoms, benzoylamino, sulfobenzoylamino, alkanoylamino of 2 to 5 carbon atoms, hydroxy, sulfato, phosphato, acetoxy, sulfo, carboxy and phenyl unsubstituted or substituted by substituents selected from alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms and sulfo, or

W* is an alkylene-phenylene, phenylene-alkylene, phenylene-alkylene-phenylene or alkylene-phenylene-alkylene group, the alkylene moieties of which are of 1 to 6 carbon atoms unsubstituted or substituted by 1 or 2 substituents selected from chlorine, alkoxy of 1 to 4 carbon atoms, benzoylamino, sulfobenzoylamino, alkanoylamino of 2 to 5 carbon atoms, hydroxy, sulfato, phosphato, acetoxy, sulfo, carboxy and phenyl unsubstituted or substituted by substituents selected from alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms and sulfo, and interrupted or non-interrupted by 1 or 2 hetero groups selected from those mentioned above, and the phenylene moieties of which are unsubstituted or substituted by 1 or 2 substituents selected from the group of substituents consisting of sulfo, carboxy, sulfamoyl, carbamoyl, methyl, ethyl, methoxy, ethoxy, nitro, chlorine, amino and amino substituted by alkyl of 1 to 4 carbon atoms, phenyl and/or phenylalkyl with an alkyl of 1 to 4 carbon atoms, or

W* is phenylene or naphthylene, or phenylene or naphthylene both of which are substituted by substituents selected from alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, sulfo, carboxy, sulfamoyl, carbamoyl, carbamoyl which is mono- or disubstituted by phenyl, alkyl of 1 to 4 carbon atoms, phenylalkyl with an alkyl of 1 to 4 carbon atoms and/or cycloalkyl of 5 to 8 carbon atoms, sulfamoyl which is mono- or disubstituted by phenyl, alkyl of 1 to 4 carbon atoms, phenylalkyl with an alkyl of 1 to 4 carbon atoms and/or cycloalkyl of 5 to 8 carbon atoms, trifluoromethyl, benzoylamino, sulfobenzoylamino, alkanoylamino of 2 to 5 carbon atoms, nitro, amino and amino mono- or disubstituted by alkyl of 1 to 4 carbon atoms, phenyl, phenylalkyl with an alkyl of 1 to 4 carbn atoms, and/or cycloalkyl of 5 to 8 carbon atoms, or

W* is one of the above-mentioned alkylene and arylene moieties which are connected with one another by one of the above-mentioned hetero groups, or

W* is a cycloalkylene of 5 to 10 carbon atoms unsubstituted or substituted by alkyl of 1 to 4 carbon atoms, or is an alkylene-cycloalkylene or cycloalkylene-alkylene or alkylene-cycloalkylene-alkylene the alkylene moieties of which are of 1 to 4 carbon atoms and the cycloalkylene moieties of which are of 5 to 8 carbon atoms and may be substituted by alkyl of 1 to 4 carbon atoms;

at least one of the sulfo and sulfato groups which may be present in the molecule as mentioned above being necessarily present in the molecule.

4,898,945

PROCESS FOR 6,7-DIHYDRO-5,8-DIMETHYL-9-FLUORO-1-OXO-1H,5H-BENZO[I,J]QUINOLIZINE-2-CARBOXYLIC ACID

Bruce E. Williams, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 821,048, Jan. 11, 1986, abandoned. This application Nov. 4, 1988, Ser. No. 268,608

Int. Cl.[4] C07D *455/06, 215/12*

U.S. Cl. 546—95 **7 Claims**

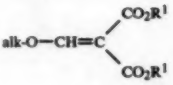
1. A process for the preparation of 6,7-dihydro-5,8-dimethyl-9-fluoro-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid comprising the steps of:

(1) reacting bromine with 6-fluoro-2-methylquinoline to give 5-bromo-6-fluoro-2-methylquinoline, and

(2) reacting 5-bromo-6-fluoro-2-methylquinoline with a methyl Grignard reagent in the presence of dichloro[1,3-bis(diphenylphosphino)propane] nickel (II) to provide 2,5-dimethyl-6-fluoroquinoline, and

(3) reducing said 2,5-dimethyl-6-fluoroquinoline to provide the corresponding 2,5-dimethyl-6-fluoro-1,2,3,4-tetrahydroquinoline, and

(4) condensing said 2,5-dimethyl-6-fluoro-1,2,3,4-tetrahydroquinoline with a diester of an alkoxymethylenemalonic acid of the formula



wherein alk is an alkyl group containing 1 to about 4 carbon atoms and each R^1 is independently an alkyl group containing 1 to about 4 carbon atoms or the R's together form an isopropyl radical to provide a diester of 2-(N-tetrahydroquinolinyl)methylenemalonic acid, and

(5) ring closing said diester of 2-(N-tetrahydroquinolinyl)-methylenemalonic acid to provide an ester of 6,7-dihydro-5,8-dimethyl-9-fluoro-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid, and

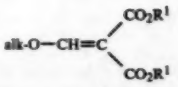
(6) hydrolyzing the ester to give a 6,7-dihydro-5,8-dimethyl-9-fluoro-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid.

5. A process for the preparation of an ester of 6,7-dihydro-5,8-dimethyl-9-fluoro-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid comprising the steps of:

(1) reacting 5-bromo-6-fluoro-2-methylquinoline with a methyl Grignard reagent in the presence of dichloro[1,3-bis(diphenylphosphino)propane] nickel (II) to provide 2,5-dimethyl-6-fluoroquinoline, and

(2) reducing said 2,5-dimethyl-6-fluoroquinoline to provide the corresponding 2,5-dimethyl-6-fluoro-1,2,3,4-tetrahydroquinoline, and

(3) condensing said 2,5-dimethyl-6-fluoro-1,2,3,4-tetrahydroquinoline with a diester of an alkoxymethylenemalonic acid of the formula



wherein alk is an alkyl group containing 1 to about 4 carbon atoms and each R^1 is independently an alkyl group containing 1 to about 4 carbon atoms or the two R' moieties together form an isopropyl radical to provide a diester of 2-(N-tetrahydroquinolinyl)methylenemalonic acid, and

(4) ring closing said diester of 2-(N-tetrahydroquinolinyl)-methylenemalonic acid to provide an ester of 6,7-dihydro-5,8-dimethyl-9-fluoro-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid.

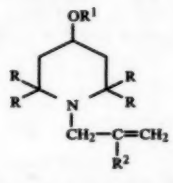
4,898,946

PROCESS FOR THE PREPARATION OF N-ALLYL-PIPERIDINE DERIVATIVES

Silvestro Costanzi, San Giuliano Milanese; Damiano Gussoni, Milan, and Luciano Pallini, Fornovo di Taro, all of Italy, assignors to Enichem Synthesis S.p.A., Palermo, Italy

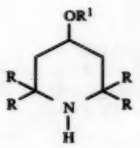
Filed Jun. 3, 1987, Ser. No. 56,880
Claims priority, application Italy, Jun. 11, 1986, 20756 A/86
Int. Cl.[4] C07D *211/40*
U.S. Cl. 546—216 **11 Claims**

1. A process for preparing a 2,2,6,6-tetraalkyl-piperidine derivative of general formula I



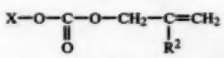
I

wherein R is $(C_1–C_4)$alkyl, R^1 is hydrogen, straight or branched $(C_1–C_{20})$alkyl, straight or branched $(C_3–C_{20})$alkenyl or phenyl-$(C_1–C_6)$alkyl and R^2 is hydrogen or methyl, which comprises reacting a 2,2,6,6-tetraalkyl-piperidine derivative of formula II



II

wherein R and R^1 are as defined above with an allylic carbonate of formula III



III

wherein X is a $—CH_2—C(R^2)=CH_2$, $(C_1–C_4)$alkyl or aryl-$(C_1–C_4)$alkyl group, and R^2 is as defined above, in the presence of a palladium catalyst.

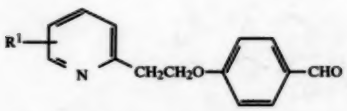
4,898,947

PYRIDINE AND THIAZOLIDINEDIONE DERIVATIVES

Kanji Meguro, Nishinomiya; Takeshi Fujita, Takarazuka; Chitoshi Hatanaka, Nagaokakyo, and Satoru Ooi, Suita, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

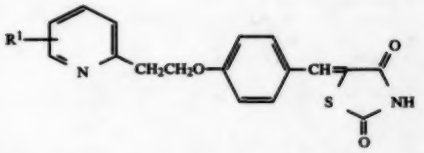
Division of Ser. No. 73,695, Jul. 19, 1987, Pat. No. 4,812,570. This application Dec. 29, 1988, Ser. No. 291,782
Claims priority, application Japan, Jul. 24, 1986, 61-174278
Int. Cl.[4] C07D *213/46, 413/12*
U.S. Cl. 546—280 **2 Claims**

1. A compound of the formula:



wherein R^1 is hydrogen or a lower alkyl.

2. A compound of the formula:



wherein R^1 is hydrogen or a lower alkyl.

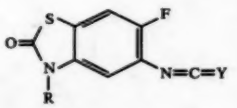
4,898,948

BENZOTHIAZOLYLAZOLIDINES, AND THEIR PRODUCTION AND USE

Toru Haga, Takarazuka; Eiki Nagano, Nishinomiya; Kouichi Morita, and Ryo Sato, both of Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 194,904, May 17, 1988, Pat. No. 4,828,605, which is a division of Ser. No. 750, Jan. 6, 1987, Pat. No. 4,786,310. This application Feb. 21, 1989, Ser. No. 312,754
Claims priority, application Japan, Jan. 6, 1986, 61-001172; Mar. 17, 1986, 61-059035
Int. Cl.[4] C07D *277/68*
U.S. Cl. 548—171 **8 Claims**

1. A compound of the formula:



(III)

wherein R is a $C_1–C_5$ alkyl group, a $C_3–C_5$ alkenyl group, a $C_3–C_5$ alkynyl group or a $C_1–C_3$ alkoxy $(C_1–C_3)$alkyl group and Y is a sulfur atom or an oxygen atom.

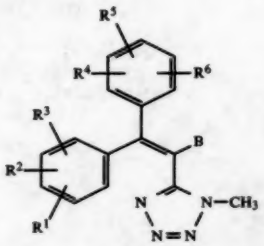
4,898,949

INTERMEDIATES FOR THE PREPARATION OF ANTIHYPERCHOLESTEROLEMIC TETRAZOLE COMPOUNDS

John J. Wright, Middletown; Sing-Yuen Sit, Meriden; Neelakantan Balasubramanian, Bristol, and Peter J. Brown, Cromwell, all of Conn., assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 18,558, Feb. 25, 1987. This application Feb. 18, 1988, Ser. No. 151,512
Int. Cl.[4] C07D *257/04*
U.S. Cl. 548—253 **24 Claims**

1. A compound of the formula



wherein

R^1 and R^4 each are independently hydrogen, halogen, C_{1-4} alkyl, C_{1-4} alkoxy or trifluoromethyl;

R^2, R^3, R^5 and R^6 each are independently hydrogen, halogen, C_{1-4} alkyl or C_{1-4} alkoxy;
B is hydrogen, C_{1-6} alkoxycarbonyl or CH_2Y;
Y is hydrogen, hydroxyl or X; and
X is bromo, chloro or iodo.

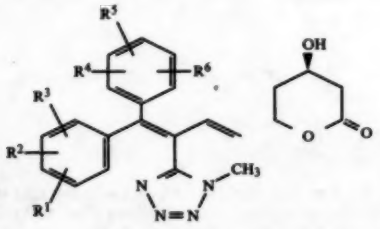
4,898,950

PREPARATION OF ANTIHYPERCHOLESTEROLEMIC TETRAZOLE COMPOUNDS

William T. Han, Cheshire, and John J. Wright, Middletown, both of Conn., assignors to Bristol-Myers Company, New York, N.Y.

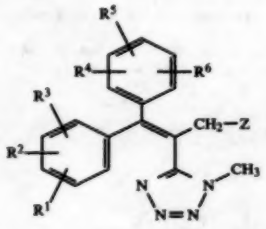
Division of Ser. No. 156,865, Feb. 18, 1988, Pat. No. 4,824,959. This application Feb. 6, 1989, Ser. No. 306,118
Int. Cl.[4] C07D 405/06
U.S. Cl. 548—253 6 Claims

1. A process for preparing a compound of the formula



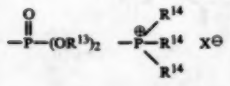
in substantially the trans-(4R,6S) form wherein R^1 and R^4 each are independently hydrogen, halogen, C_{1-4} alkyl, C_{1-4} alkoxy, or trifluoromethyl; and R^2, R^3, R^5 and R^6 each are independently hydrogen, halogen, C_{1-4} alkyl or C_{1-4} alkoxy, comprising the steps of

(a) reacting a compound of the formula

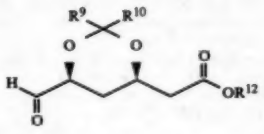


X

wherein R^1, R^2, R^3, R^4, R^5, and R^6 are as defined above and Z is

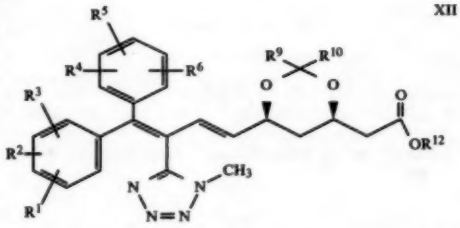


wherein R^{13} is C_{1-4} alkyl; R^{14} is phenyl which is unsubstituted or substituted by one or two C_{1-4} alkyl or chloro substituents; and X is bromo, chloro or iodo with a compound of the formula



IIIb

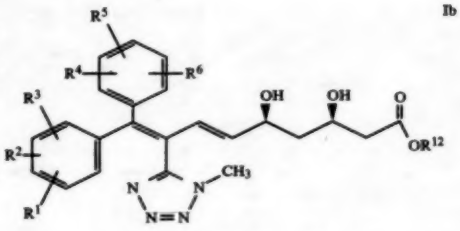
in substantially the cis-(4R,6S) form wherein R^9 and R^{10} each are C_{1-4} alkyl or R^9 and R^{10}, taken together with the carbon atom to which they are attached, is cyclopentyl, cyclohexyl or cycloheptyl; and R^{12} is hydrogen, C_{1-4} alkyl or a metal cation, to produce a compound of the formula



XII

in substantially the cis-(4R,6S) form wherein R^1, R^2, R^3, R^4, R^5, R^6, R^9, R^{10} and R^{12} are as defined above;

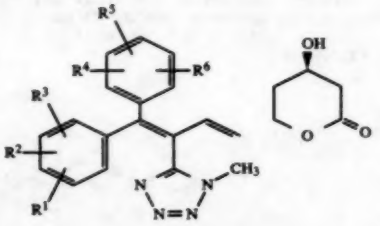
(b) reacting a compound of Formula XII with acid to produce a compound of the formula



Ib

wherein R^1, R^2, R^3, R^4, R^5, R^6 and R^{12} are as defined above; and

(c) cyclizing a compound of Formula Ib wherein R^{12} is hydrogen, to produce a compound of formula



in substantially the trans-(4R,6S) form wherein R^1, R^2, R^3, R^4, R^5, and R^6 are as defined above.

4,898,951

COMPOUNDS USED AS INTERMEDIATES IN THE PREPARATIONS OF NON-RADIOACTIVE BIOLOGICAL PROBES

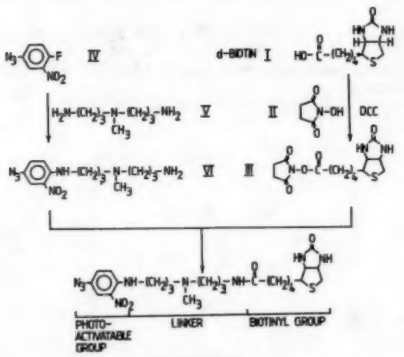
Robert H. Symons, Adelaide, Australia, assignor to Bresatec Limited, Adelaide, Australia

Continuation of Ser. No. 712,705, Mar. 15, 1985, abandoned. This application May 4, 1988, Ser. No. 191,811

Claims priority, application Australia, Mar. 22, 1984, PG4200; Oct. 4, 1984, PG7500

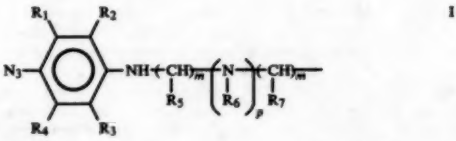
Int. Cl.[4] C07D *495/04*; C07C *117/00*

U.S. Cl. 548—303 **8 Claims**

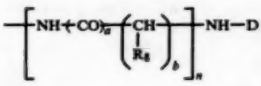


PHOTOBIOTIN, VII

1. A compound of the Formula I



I



wherein

R_1 to R_4, which may be the same or different, are selected from the group consisting of H, alkyl of 1 to 5 carbon atoms, NO_2, halogen, —COOH, and $—NH_2$;

wherein R_5, R_6, R_7, R_8 which may be the same or different are selected from the group consisting of H, alkyl of 1 to 5 carbon atoms and halogen; wherein

n is an integer of 0 to 5

m is an integer of 1 to 10

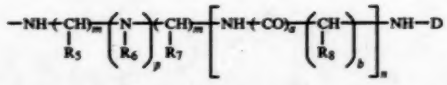
p is an integer of 0 to 1

a is an integer of 0 to 1

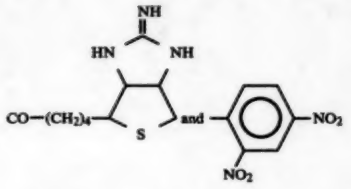
b is an integer of 1 to 10

wherein if a is 1 then b is 1, and

wherein the moiety



includes at least 5 carbon atoms and wherein D is selected from the group consisting of



4,898,952

REGIOSELECTIVE SYNTHESIS OF A 1,5-DISUBSTITUTED PYRAZOLE

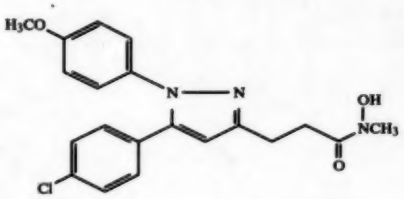
William V. Murray, Belle Mead, and Michael P. Wachter, Bloomsbury, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Continuation of Ser. No. 55,807, May 29, 1987, abandoned. This application Feb. 6, 1989, Ser. No. 307,140

Int. Cl.[4] C07D *231/12*

U.S. Cl. 548—378 **1 Claim**

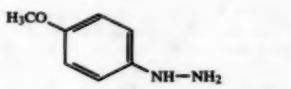
1. A process for the preparation of 3-[5-(4-chlorophenyl)-1-(4-methoxyphenyl)-3-pyrazolyl]-N-hydroxy-N-methyl-propanamide of the following formula (IX):



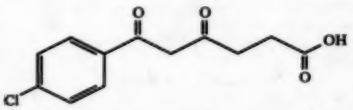
(IX)

which comprises the steps of

(i) reacting a hydrazine of the following formula (X) with a diketoacid of the following formula (XI):

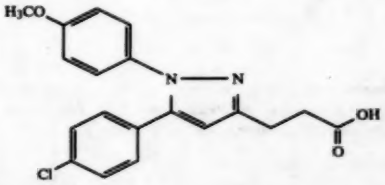


(X)



(XI)

at a temperature of about 0°–100° C., to form a pyrazole acid of the following (XII):

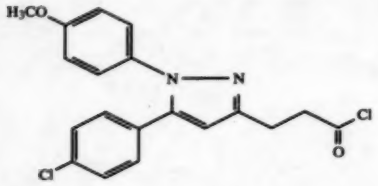


(XII)

followed by

(ii) chlorinating the pyrazole acid (XII) oxalyl chloride to

yield the pyrazole acid chloride of the following formula (XIII):



(XIII)

followed by

(iii) reacting the pyrazole acid chloride (XIII) with methylhydroxylamine hydrochloride to yield the methylpropanamide of formula (IX).

4,898,953

NATURAL VITAMIN E INTERMEDIATE

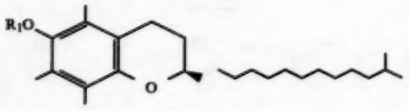
Ka-kong Chan, Hopatcong, N.J., and Gabriel G. Saucy, Vero Beach, Fla., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 135,128, Dec. 18, 1987, Pat. No. 4,831,185. This application Jan. 30, 1989, Ser. No. 303,507

Int. Cl.[4] C07D *311/72*

U.S. Cl. 549—408 **3 Claims**

1. An optically active compound of the formula:



wherein R_1 taken together with its attached oxygen atom forms a hydrolyzable ether hydroxy protecting group.

4,898,954

PROCESS FOR THE PREPARATION OF OXIRANES

Karl H. Mohrmann; Wolf Reiser, both of Wuppertal, Fed. Rep. of Germany; Siegfried W. Linke, Seoul, Rep. of Korea, and Rudolf Zerbes, Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

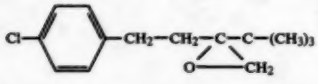
Continuation of Ser. No. 603,527, Apr. 25, 1984, abandoned. This application Sep. 3, 1985, Ser. No. 772,066

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1983, 3315681

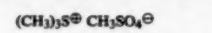
Int. Cl.[4] C07D *301/02*

U.S. Cl. 549—519 **8 Claims**

1. A process for the preparation of an oxirane of the formula



which comprises contacting dimethyl sulphide with dimethyl sulphate in the presence of tert.-butanol thereby to form trimethylsulphonium methyl sulphate of the formula



and thereafter, without isolating said trimethylsulphonium methyl sulphate, contacting the same with 1-(4-chlorophenyl)-4,4-dimethyl-3-pentanone in the presence of potassium tert.-butylate and in the presence of tert.-butanol at temperatures between 0° and 60° C.

4,898,955

META-CONTAINING ENOLATE COMPOUNDS

Gerard Van Koten, Den Dolder; Frederick H. Van Der Steen, Utrecht, and Johann T. B. H. Jastrzebski, De Bilt, all of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

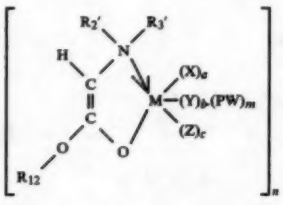
Division of Ser. No. 151,816, Feb. 3, 1988. This application Dec. 12, 1988, Ser. No. 283,194

Claims priority, application European Pat. Off., Feb. 6, 1987, 87-200185.4

Int. Cl.[4] C07F *3/06, 5/06, 7/10, 5/02*

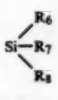
U.S. Cl. 556—12 **3 Claims**

1. A compound of the formula

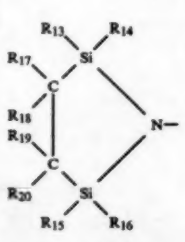


II

wherein R_{12} is selected from the group consisting of alkyl, aryl and aralkyl, each unsubstituted or substituted with alkyl, aryl or aralkyl, M is selected from the group consisting of zinc, aluminum, zirconium, boron, tin and titanium, P is alkali metal, X, Y and Z are individually selected from the group consisting of alkyl, aryl and alkoxide, W is selected from the group consisting of thiolate, and triflate, and a,b,c and m are 0 or 1 with at least one being 1, n=1–6, all being integers, R_2' and R_3' are individually selected from the group consisting of hydrogen, alkyl, aryl and aralkyl, each unsubstituted or substituted with alkyl, aryl, or aralkyl or



wherein R_6, R_7 and R_8 are individually selected from the group consisting of alkyl, aryl and aralkyl, R_2' and R_3' together with the nitrogen atom to which they are attached form a ring of formula III



III

wherein R_{13}, R_{14}, R_{15}, R_{16}, R_{17}, R_{18}, R_{19} and R_{20} are individually selected from the group consisting of alkyl, aryl and aralkyl.

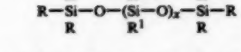
4,898,956

METHOD TO PREPARE THERMO-OXIDATIVELY STABLE PHENYLMETHYLSILOXANE FLUIDS

Terrence K. Hilty, Midland County, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Jun. 27, 1989, Ser. No. 372,495
Int. Cl.[4] C07F 7/08, 7/18
U.S. Cl. 556—401 21 Claims

1. A polysiloxane fluid consisting essentially of (i) a polysiloxane of the formula



where each R is independently selected from an alkyl group having 1 to 6 carbons and an aryl group having 5 to 10 carbons; each R^1 is independently selected from phenyl and methyl groups, with the proviso that they are not all methyl; and x equals 3 to 100 and,
(ii) an organozirconium compound.

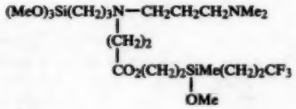
4,898,957

ORGANOSILICON DIAMINE ANTIMICROBIAL COMPOUND

Edwin P. Plueddemann, Midland, and Anthony Revis, Freeland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 182,698, Apr. 18, 1988, Pat. No. 4,866,192.
This application Jun. 7, 1989, Ser. No. 362,987
Int. Cl.[4] C07F 7/04
U.S. Cl. 556—418 1 Claim

1. A compound of the formula



wherein Me is methyl.

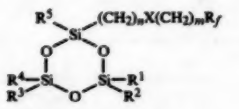
4,898,958

ORGANOSILICON COMPOUND

Hirofumi Kishita, Annaka; Koichi Yamaguchi, Takasaki, and Akira Yoshida, Tokyo, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

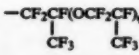
Filed Sep. 9, 1988, Ser. No. 242,173
Claims priority, application Japan, Sep. 11, 1987, 62-227909
Int. Cl.[4] C07F 7/08
U.S. Cl. 556—448 2 Claims

1. An organosilicon compound represented by general formula (I):

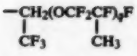


(I)

wherein R^1, R^2, R^3, R^4 and R^5 may be the same or different and each represent an alkyl group having 1 to 4 carbon atoms; R_f represents



where q represents an integer of 1 to 5, or



where q is as defined above; and X represents —O— or —CH_2—; provided that n is 3 and m is an integer of 0 to 2 when X represents —O—, and n is 0 and m is 1 when X represents —CH_2—.

4,898,959

METHOD FOR THE PREPARATION OF BETA-SUBSTITUTED ALLYLSILANE

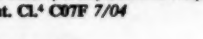
Makoto Yoshitake; Shinichiro Yamane, and Akihiko Shirahata, all of Chiba, Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Dec. 20, 1988, Ser. No. 287,411
Claims priority, application Japan, Dec. 24, 1987, 62-327628
Int. Cl.[4] C07F 7/08
U.S. Cl. 556—466 5 Claims

1. A method for the preparation of betasubstituted allylsilane with the general formula (IV)

(IV)

said method comprising reacting, in an organic solvent, a Grignard reagent with the general formula (III)



(III)

with a substrate compound selected from the group consisting of an acid anhydride with the general formula (II)

(II)

and a carboxylic acid ester with the general formula (I)

(I)

where, in the preceding formulae (I), (II), (III), and (IV), R^1 is a hydrogen atom or a hydrocarbon group having 1 to 20 carbon atoms, R^2 is a hydrocarbon group having 1 to 4 carbon atoms, R^3, R^4, and R^5 are independently selected from the group consisting of hydrocarbon groups having 1 to 3 carbon atoms or alkoxy groups, at least one of R^3, R^4, and R^5 being an alkoxy group having at least 3 carbon atoms, and X is a halogen atom.

4,898,960

METHOD OF DIRECT PROCESS PERFORMANCE IMPROVEMENT VIA CONTROL OF SILICON MANUFACTURE

Vishu D. Dosaj, Midland, Mich.; Roland L. Halm, Madison, Ind., and Oliver K. Wilding, Jr., Wales, United Kingdom, assignors to Dow Corning Corporation, Midland, Mich.

Filed Dec. 22, 1986, Ser. No. 945,128
Int. Cl.[4] C07F 7/08, 7/16
U.S. Cl. 556—472 32 Claims

1. A method of improving the performance of a process for the manufacture of alkylhalosilane, said process comprising, contacting an alkylhalide with silicon at a temperature of 250° to 350° C. in the presence of tin or tin compounds, and copper or copper compounds, wherein there is at least also present 25 to 2500 parts per million, based upon the silicon in a reaction mass, of a phosphorous promoter, which method further comprises controlling the level of the phosphorous promoter in the silicon by incorporating and controlling the level of phosphorous in the mass of the silicon by controlling the amount of phosphorous that is introduced into a silicon smelter during the manufacture of silicon.

4,898,961

METHOD FOR PREPARING ALKENYLSILANES

Gaaneshwar R. Baile, Midland; Donald E. McVannel, Hemlock, both of Mich.; Kirsten L. Reading, North Royalton, Ohio, and Ginger L. Hall, Barry, Wales, assignors to Dow Corning Corporation, Midland, Mich.

Filed Jul. 17, 1989, Ser. No. 380,929
Int. Cl.[4] C07F 7/08
U.S. Cl. 556—479 6 Claims

1. In a method for preparing an alkenylsilane by the reaction of an acetylenic hydrocarbon with a silane containing a silicon-bonded hydrogen atom, where the reaction is conducted in the presence of a liquid medium comprising said alkenylsilane and a solubilized hydrosilylation catalyst, the improvement comprising

a. a conducting said reaction under a pressure below the critical decomposition temperature of said acetylenic hydrocarbon by introducing a homogeneous gaseous mixture consisting essentially of said acetylenic hydrocarbon and said silane into a reactor wherein said mixture is directed into contact with the surface of at least one moving layer of a liquid medium comprising said alkenylsilane and said catalyst, where said medium is an effective solvent for said acetylenic hydrocarbon,

b. maintaining the relative concentrations of acetylenic hydrocarbon and gaseous silane in said mixture equivalent to a molar ratio of hydrocarbon to silane of greater than 1, and

c. adjusting the flow rates of said homogeneous mixture and said liquid medium to maintain the temperature within said reactor at a level favoring formation of said alkenysilane and which is not conducive to further reaction of said alkenylsilane and decomposition of said acetylenic hydrocarbon.

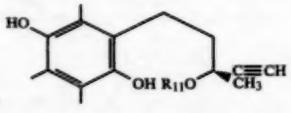
4,898,962

NATURAL VITAMIN E INTERMEDIATE

Ka-kong Chan, Hopatcong, N.J., and Gabriel G. Saucy, Vero Beach, Fla., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 135,128, Dec. 18, 1987, Pat. No. 4,831,185.
This application Jan. 30, 1989, Ser. No. 303,705
Int. Cl.[4] C07C 67/02
U.S. Cl. 558—58 1 Claim

1. A compound of the formula



wherein R_{11} is mesyl, tosyl or lower alkanoyl.

4,898,963

PROCESS FOR THE RECOVERY OF ACID ORGANOPHOSPHORUS COMPOUNDS AND/OR ORGANOPHOSPHATE IONS PRESENT IN AN AQUEOUS SOLUTION

André Chesne, le Vesinet; Sylvie Chevalier, Paris; Michel Germain, Marcoussis, and Dominique Pareau, Verrieres le Buisson, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Oct. 29, 1987, Ser. No. 114,622
Claims priority, application France, Oct. 30, 1986, 86 15127
Int. Cl.[4] C07C 9/08
U.S. Cl. 558—146 10 Claims

1. Process for the recovery of acid organophosphorus compounds, organophosphate ions and mixtures thereof present in an aqueous solution, comprising contacting the aqueous solution with an organic solution comprising at least one organic amino compound which is not very soluble in water and which is dissolved or diluted in an organic solvent, said organic solvent selected from the group consisting of aromatic and paraffinic hydrocarbons, organochloro compounds, ethers, esters, alcohols, ketones and mixtures thereof, wherein said organic amino compounds have at least one amine function selected from the group consisting of cyclic amines; primary, secondary and tertiary amines; acid salts of these amino compounds, quaternary ammonium salts, and mixtures thereof, and recovering, in the organic solution, the complex formed by the reaction of the acid organophosphorus compounds, organophosphate ions and mixtures thereof with one or more of the organic amino compounds.

4,898,964

ADDITIVES FOR SYNTHETIC RESINS

Mitsuo Kinoshita, Aichi; Shigeru Imamura, Toyokawa, and Hirokazu Matsueda, Toyohashi, all of Japan, assignors to Takemoto Yushi Kabushiki Kaisha, Aichi, Japan

Continuation-in-part of Ser. No. 943,046, Dec. 18, 1986, abandoned. This application Jul. 6, 1989, Ser. No. 376,142
Claims priority, application Japan, Feb. 21, 1986, 61-37718
Int. Cl.[4] C07C 122/00, 69/80, 69/40, 69/60
U.S. Cl. 558—416 10 Claims

1. An additive for synthetic resins containing a block copolymer of the form. $X—Y)_n$ where

X is polybutadiene block, hydrogenated polybutadiene block, polyisoprene block or hydrogenated polyisoprene block with molecular weight of 1000–50000, occupying 10–95 weight % of said block copolymer,

Y is polyester block having connected ester linkage one or more types of organic dicarboxylic anhydride and one or more types of 1,2-epoxide selected from the group consisting of ethylene oxide, propylene oxide and butylene oxide,

X and Y are connected by ester linkage,

n is an integer between 1 and 10, and

$X—Y)_n$ is obtained by starting with carboxyl group or hydroxyl group in polybutadiene, hydrogenated polybutadiene, polyisoprene or hydrogenated polyisoprene and by alternate condensation of said organic dicarboxylic anhydride and said 1,2-epoxide therewith in the presence of a catalyst.

3. The additive of claim 1 wherein at least one of said polyester blocks has a reactive group selected from the group consisting of vinyl group, isocyanate group and carboxylic acid group.

4,898,965

ADDITIVES FOR SYNTHETIC RESINS

Mitsuo Kinoshita; Shigeru Imamura, and Hirokazu Matsueda, all of Aichi, Japan, assignors to Takemoto Yushi Kabushiki Kaisha, Aichi, Japan

Continuation-in-part of Ser. No. 117,797, Nov. 5, 1987, abandoned. This application Jul. 6, 1989, Ser. No. 376,141
Claims priority, application Japan, Nov. 7, 1986, 61-266435
Int. Cl.[4] C07C 122/00, 69/80, 69/40, 69/60
U.S. Cl. 558—416 14 Claims

1. An additive for synthetic resins including a block copolymer of the form $X—Y_n$ where

X is polybutadiene block, hydrogenated polybutadiene block, polyisoprene block or hydrogenated polyisoprene block with molecular weight 1000–50,000,

Y is polyester block obtained by ring-opening polymerization of ε-aliphatic lactone, at least one of said polyester blocks having a reactive group selected from the group consisting of vinykl group, isocyanate group and carboxylic acid group,

X and Y are connected by ester linkage,

n is an integer between 1 and 10, and

$X—Y_n$ is obtained by starting with carboxyl group or hydroxyl group in polybutadiene, hydrogenated polybutadiene, polyisoprene or hydrogenated polyisoprene and by

ring-opening polymerization of said ϵ-aliphatic lactone in the presence of a catalyst, said polyester block or blocks and said reactive group or groups comprising 10–60 weight % of said block copolymer.

4,898,966

PROCESS FOR THE PREPARATION OF PHENYLALANINE N-PROPYL ESTER HYDROCHLORIDE

Heinz Erpenbach, Cologne; Klaus Gehrmann; Peter Hörstermann, both of Erftstadt; Erhard Jägers, Bornheim, and Georg Kohl, Hürth, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 11, 1988, Ser. No. 256,052

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1987, 3736078

Int. Cl.[4] C07C *101/10*

U.S. Cl. 560—38 **4 Claims**

1. A process for the preparation of phenylalanine n-propyl ester hydrochloride, which comprises reacting phenylalanine hydrochloride with n-propanol in a molar ratio 1:(5 to 20) at temperatures from 80° to 110° C. and pressures from 0.1 to 1.5 bar in the presence of 0.1 to 0.75 mole of HCl/mole of phenylalanine hydrochloride and in the presence of an entrainer selected from the group consisting of toluene and 1,2-dichloroethane, a concentration of said entrainer of 20 to 50% by weight being maintained in the reaction mixture, and said entrainer being removed by distillation during the reaction as an azeotrope with water at a reflux rate of 3 to 10, the organic phase being fed back, at least partly, into the reaction mixture after the phases have been separated.

4,898,967

PROCESS FOR THE PRODUCTION OF SUBSTITUTED 2-OXOCYCLOHEXANEACETIC ACID ESTERS

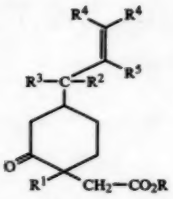
Philip F. Hughes, Hopewell; Dominick Mobilio, Plainsboro, and Leslie G. Humber, North Brunswick, all of N.J., assignors to American Home Products Corp., New York, N.Y.

Division of Ser. No. 131,698, Dec. 11, 1987, which is a division of Ser. No. 20,426, Mar. 2, 1987, Pat. No. 4,748,266, which is a continuation-in-part of Ser. No. 868,230, May 28, 1986, abandoned. This application Feb. 13, 1989, Ser. No. 310,264

Int. Cl.[4] C07C *69/76, 69/74*

U.S. Cl. 560—051 **5 Claims**

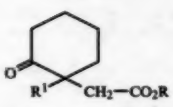
1. The process for producing compounds of formula (V)



(V)

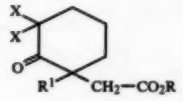
wherein R and R^1 are lower alkyl; R^2, R^3, and R^5 are hydrogen, or lower alkyl wherein lower alkyl contains 1 to 6 carbon atoms; each R^4 is independently selected from the group consisting of hydrogen, and lower alkyl wherein lower alkyl contains 1 to 6 carbon atoms, or R^3 is joined to the R^4 which is cis to the carbon bearing R^3 to form $—CH_2—_m$ wherein m is 2 to 3 which comprises

(a) dihalogenating the compound of formula (I)



(I)

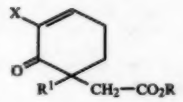
wherein R and R^1 are as defined above with a halogenating agent in a suitable solvent to produce the compound (II)



(II)

wherein R and R^1 are as defined above; and X is chlorine, or bromine;

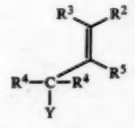
(b) dehydrohalogenating the compound (II) in the presence of a base and optionally in the presence of added salts in a suitable solvent to produce the compound (III)



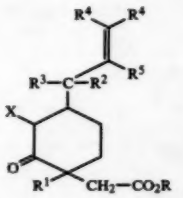
(III)

wherein R, R^1, and X are as defined above;

(c) reacting the compound (III) with



wherein R^2, R^3, and R^5 are hydrogen, or lower alkyl wherein lower alkyl contains 1 to 6 carbon atoms; each R^4 is independently selected from the group consisting of hydrogen, or lower alkyl wherein lower alkyl contains 1 to 6 carbon atoms, or R^3 is joined to one of the R^4 substituents to form $—CH_2—_m$ wherein m is 2 to 3; Y is selected from the group consisting of $SiR^6R^7R^8$ and $SnR^6R^7R^8$ wherein R^6, R^7, and R^8 are independently selected from the group consisting of hydrogen, straight chain or branched lower alkyl containing 1 to 6 carbon atoms, cycloalkyl, aryl, arylalkykl, halogen, or alkoxy in the presence of a Lewis acid to produce the compound (IV)



(IV)

wherein R, R^1, R^2, R^3, R^4, R^5, and X are as defined above;

(d) dehalogenating the compound (IV) with a reducing agent to produce the desired compound (V).

4,898,968

CYCLOPROPANE DERIVATIVES

Edward McDonald, Marlow, and Roger Salmon, Bracknell, both of England, assignors to Imperial Chemical Industries PLC, London, England

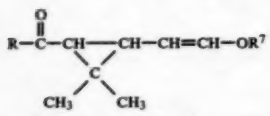
Division of Ser. No. 928,461, Nov. 10, 1986, Pat. No. 4,760,443, which is a division of Ser. No. 712,252, Mar. 15, 1985, Pat. No. 4,661,488. This application May 2, 1988, Ser. No. 188,850

Claims priority, application United Kingdom, Mar. 26, 1984, 8407810; Jul. 20, 1984, 8418612; Feb. 4, 1985, 8502778

Int. Cl.[4] C07C *69/743*

U.S. Cl. 560—124 2 Claims

1. A compound of formula:



wherein R is alkoxy of up to 6 carbon atoms and R^7 is alkyl of up to 6 carbon atoms.

4,898,969

TRANSESTERIFICATION OF ALKOXYESTERS

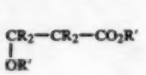
Glenn C. Jones, and William D. Nottingham, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 8, 1988, Ser. No. 179,167

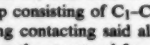
Int. Cl.[4] C07C *69/66*

U.S. Cl. 560—187 11 Claims

1. A method for the transesterification of alkoxyesters having the structural formula:

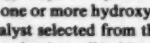


wherein each R is independently selected from the group consisting of H and C_1–C_{10} alkyl moieties, with the provision that the total number of carbon atoms for all R groups does not exceed 10, and each R′ is independently selected from the group consisting of C_1–C_{10} alkyl moieties; said method comprising contacting said alkoxyester with at least one alcohol having the structural formula:



wherein each R″ is selected from the group consisting of C_1–C_{20} alkyl or cycloalkyl moieties, optionally substituted with one or more hydroxy- or alkoxy-moiety in the presence of a catalyst selected from the group consisting of:

(i) a titanium alkoxide catalyst having the formula:



wherein each R‴ is independently selected from the group consisting of C_1–C_{10} alkyl moieties, and

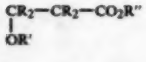
(ii) a tin compound selected from the group consisting of:

dibutyltin diacetate,

dibutyltin oxide, and

dibutyltin dilaurate,

wherein said contacting is carried out for a time and at a temperature sufficient to produce the desired transesterification product having the structural formula:



4,898,970

PROCESS FOR PRODUCING FLUORINATED ESTERS

Eiji Ogura; Kunihiro Mito, and Shoji Arai, all of Shinnanyo, Japan, assignors to Onoda Cement Co., Ltd., Onoda and Tosoh Corporation, Shinnanyo, both of, Japan

Filed Feb. 1, 1983, Ser. No. 463,020

Claims priority, application Japan, Feb. 5, 1982, 57-17128

Int. Cl.[4] C07C *67/11, 69/003, 69/14*

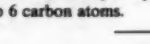
U.S. Cl. 560—236 5 Claims

1. A process for producing a fluorinated ester containing a trifluoromethyl group, which comprises:

subjecting a 1,1,1-trifluoro-2-halogenated ethane of the formula

wherein X is Cl or Br, in γ-butyrolactone used as a solvent, to an esterification reaction with at least one carboxylic acid selected from the group consisting of

(1) a carboxylic acid salt of the formula

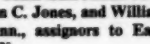


wherein

R is an alkyl group having a carbon number of not more than 19 or a phenyl group, and

M is Na, K, or Mg;

(2) a dicarboxylic acid salt represented by the general formula



wherein

R is C_0–C_8 alkylene group or a phenylene group, and

M and M′ are Na, K or Mg, which may be the same or different; and

(3) a dicarboxylic acid salt having an ether-bond in molecule, of the formula

wherein

R and R′ are C_1 to C_{10} alkylene groups which may be the same or different, and

M and M′ are the same or different and are Na, K or Mg.

4,898,971

LIQUID ISOCYANATE PREPOLYMERS

William E. Slack, Moundsville, W. Va., assignor to Mobay Corporation, Pittsburgh, Pa.

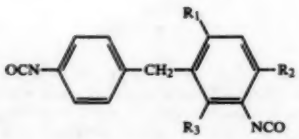
Filed Jan. 23, 1989, Ser. No. 300,868

Int. Cl.[4] C07C *118/00*; C08G *18/00*

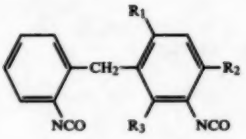
U.S. Cl. 560—359 3 Claims

1. A liquid, storage-stable isocyanate prepolymer having an isocyanate group content of from 3 to 30% by weight, prepared by reacting

(i) a diisocyanate corresponding to the formula

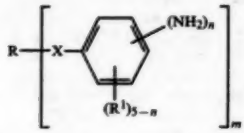


which may be present in admixture with 0 to 40% by weight, based on the total mixture, of diisocyanates corresponding to the formula



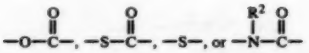
and optionally with 0 to 30% by weight, based on the total mixture, of other diisocyanatodiphenylmethane isomers which may be substituted; wherein two of the radicals R_1, R_2 and R_3 represent hydrogen and one of the radicals R_1, R_2 and R_3 represents a methyl group; with

(ii) a polyamine of the structure



where R represents an m-valent residue obtained by the removal of m-functional groups from a compound having m-functional groups and having a molecular weight of from 76 to about 10,000,

X represents —O—,



R^1 represents hydrogen or an inert substituent,

R^2 represents hydrogen, a C_1 to C_5 alkyl group or a phenyl group,

n is 1 or 2, and

m is an integer of from 2 to 8.

4,898,972

PROCESS FOR PRODUCING N-PHOSPHONOMETHYLGLYCINE

Donald L. Fields, Jr., Manchester; Raymond C. Grabiak, Maryland Heights, and Dennis P. Riley, Chesterfield, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Sep. 26, 1988, Ser. No. 248,663

Int. Cl.[4] C07F *9/38*

U.S. Cl. 562—17 **17 Claims**

1. A process for the production of N-phosphonomethylglycine which comprises contacting N-phosphonomethyliminodiacetic acid with a molecular oxygen-containing gas in the presence of an effective amount of a catalyst selected from the group consisting of the salts and salt complexes of manganese and cobalt, and an effective amount of bromide ion.

4,898,973

TRISUBSTITUTED BENZOIC ACID INTERMEDIATES

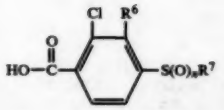
David L. Lee, Martinez, Calif., assignor to ICI Americas Inc., Wilmington, Del.

Filed Mar. 7, 1985, Ser. No. 709,006

Int. Cl.[4] C07C *149/40*

U.S. Cl. 562—429 **8 Claims**

1. Compounds having the strucutral formula



wherein R^6 is C_2–C_4 alkoxy or C_1–C_2 alkylthio; n is 0 or 2; and R^7 is C_1–C_3 alkyl.

4,898,974

PRODUCTION OF 3,3-DIMETHYL-2-OXO-BUTYRIC ACID SALT

Karlfried Dickoré, Leverkusen; Hans D. Engels, Solingen; Hans Krätzer, Wuppertal, and Walter Merz, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 227,552, Jan. 22, 1981, which is a continuation of Ser. No. 788,867, Apr. 19, 1977, which is a division of Ser. No. 650,651, Jan. 20, 1976, Pat. No. 4,052,460. This application Apr. 23, 1985, Ser. No. 726,218

Int. Cl.[4] C07C *51/09*

U.S. Cl. 562—577 **4 Claims**

1. A process for the preparation of a salt of 3,3-dimethyl-2-oxo-butyric acid which comprises contacting a solution containing a salt of 3,3-dimethyl-2-hydroxy-butyric acid in at least about 95% purity at a pH of about 9 to 12 with approximately the stoichiometric amount of a permanganate, and separating the readily filterable coarsely crystalline MnO_2 which is formed from the substantially pure dissolved salt of 3,3-dimethyl-2-oxo-butyric acid.

4,898,975

WATER SOLUBLE ORGANIC AMMONIUM PER HALIDES

Nicolai A. Favstritsky, Lafayette, Ind., assignor to Great Lakes Chemical Corporation, West Lafayette, Ind.

Division of Ser. No. 211,362, Jun. 24, 1988. This application Jul. 19, 1989, Ser. No. 382,833

Int. Cl.[4] C07C *76/06*

U.S. Cl. 564—2 **3 Claims**

1. A stabilized, aqueous perhalide composition comprising:

a water solution of an ammonium hydrohalide of the formula:

where R_1 and R_2 are independently hydrogen, hydroxyethyl, alkyl, cycloalkyl, alkyl ether, polyoxyalkylene, and halogenated alkyl; X is chlorine, bromine or iodine; and only one of R_1 and R_2 may be hydrogen; and

bromine, wherein the molar ratio of hydrohalide to bromine lies in the range of about 2–4:1.

4,898,976

METHOD OF MAKING THE ETHANOLAMINE SALT OF N-NITROSOPHENYLHYDROXYLAMINE

John W. Varwig, St. Louis, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Continuation of Ser. No. 189,251, May 2, 1988, which is a division of Ser. No. 708,313, Mar. 5, 1985, Pat. No. 4,772,740. This application Apr. 17, 1989, Ser. No. 339,450

Int. Cl.[4] C07C *76/00*

U.S. Cl. 564—112 **11 Claims**

1. The method of preparing the ethanolamine salt of N-nitrosophenylhydroxylamine comprising the step of reacting

ethanolamine and cupferron in the presence of a polar organic solvent.

4,898,977

PROCESSES FOR THE PREPARATION OF 5-AMINO-4-HYDROXYVALERIC ACID DERIVATIVES

Peter Herold, Basel, Switzerland, and Christof Angst, Summit, N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

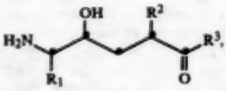
Filed Aug. 13, 1987, Ser. No. 85,437

Claims priority, application Switzerland, Aug. 13, 1986, 3248/86

Int. Cl.[4] C07C *103/19*

U.S. Cl. 564—191 6 Claims

1. A process for the preparation of a compound of the formula



(I)

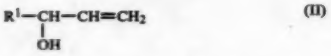
in which

R^1 represents hydrogen, alkyl, hydroxyalkyl, etherified hydroxyalkyl, esterified hydroxyalkyl, haloalkyl, carboxyalkyl, esterified carboxyalkyl, amidated carboxyalkyl, cyanoalkyl, aminoalkyl, mono- or di-lower alkylaminoalkyl, pyrrolidinoalkyl, piperidinoalkyl, morpholinoalkyl, oxoalkyl, cycloalkyl, cycloalkyl-lower alkyl, aryl, aryl-lower alkyl, 2-methylthioethyl, mercaptomethyl, 3-indolylmethyl, 4-imidazolylmethyl or 3-guanidinopropyl;

R^2 represents hydrogen, alkyl, hydroxyalkyl, etherified hydroxyalkyl, esterified hydroxyalkyl, haloalkyl, carboxyalkyl, esterified carboxyalkyl, amidated carboxyalkyl, cyanoalkyl, aminoalkyl, mono- or di-lower alkylaminoalkyl, pyrrolidinoalkyl, piperidinoalkyl, morpholinoalkyl, oxoalkyl, cycloalkyl, cycloalkyl-lower alkyl, aryl, aryl-lower alkyl, amino, mono- or di-lower alkylamino, aryl-lower alkylamino, lower alkanoylamino, lower alkoxycarbonylamino, aryl-lower alkoxycarbonylamino, pyrrolidino, piperidino, morpholino, hydroxy, lower alkoxy, lower alkanoyloxy-lower alkoxy, lower alkoxycarbonyloxy-lower alkoxy, aryloxy, aryl-lower alkoxy, lower alkanoyloxy, cycloalkylcarbonyloxy, arylcarbonyloxy, tri-lower alkylsilyloxy, mercapto, lower alkylthio, hydroxy-lower alkylthio, arylthio, aryl-lower alkylthio, lower alkanoylthio, lower alkylsulfinyl, hydroxy-lower alkylsufinyl, arylsulfinyl, aryl-lower alkylsulfinyl, lower alkylsulfonyl, hydroxy-lower alkylsulfonyl, arylsulfonyl, aryl-lower alkylsulfonyl, 2-methylthioethyl, mercaptomethyl, 3-indolylmethyl, 4-imidazolylmethyl or 3-guanidinopropyl; and

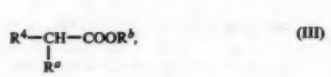
R^3 represents hydroxy, amino, substituted oxy or mono- or disubstituted amino wherein the substituent is alkyl, hydroxyalkyl, etherified hydroxyalkyl, esterified hydroxyalkyl, haloalkyl, carboxyalkyl, esterified carboxyalkyl, amidated carboxyalkyl, cyanoalkyl, aminoalkyl, mono- or di-lower alkylaminoalkyl, pyrrolidinoalkyl, piperidinoalkyl, morpholinoalkyl, oxoalkyl, cycloalkyl, cycloalkyl-lower alkyl, alkenyl, carboxyalkenyl, alkynyl, aryl, aryl-lower alkyl, heteroaryl or heteroaryl-lower alkyl, wherein heteroaryl contains one or two nitrogen atoms, an oxygen atom, a sulfur atom, one or two nitrogen atoms and an oxygen atom, or one or two nitrogen atoms and a sulfur atom, and wherein heteroaryl may be partially saturated, or R^3 represents cyclic alkyleneamino, oxaalkyleneamino, thiaalkyleneamino or azaalkyleneamino wherein the aza nitrogen atom is unsubstituted or substituted by lower alkyl, phenyl, phenyl-lower alkyl, lower alkanoyl, lower alkoxycarbonyl or phenyl-lower alkoxycarbonyl, and of salts of such a compound, comprising the steps of:

esterifying an allyl alcohol of the formula



(II)

in the presence of a catalyst with an acid or ester of the formula

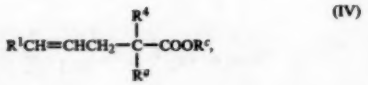


(III)

in which R^a represents hydrogen or a group $COOR^b$ and R^b represents hydrogen, lower alkyl, aryl-lower alkyl or tri-substituted silyl wherein the substituents are lower alkyl, cycloalkyl, aryl or aryl-lower alkyl, and R^4 has the meanings of R^2 or is halogen, or with a derivative of the compound of formula III wherein the group $COOR^b$ is replaced by a radical $C(OR^b)_3$ and R^b represents lower alkyl, or wherein the group $CH—COOR^b$ is replaced by a radical $C{=}C(OR^b)_2$ and R^b represents lower alkyl, or wherein one radical OR^b in $COOR^b$, $C(OR^b)_3$ or $C{=}C(OR^b)_2$ is replaced by NR_2^b;

arranging the resulting compound in situ by heating or by treatment with a base and a silylating agent followed by heating;

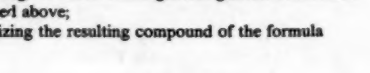
hydrolyzing the resulting compound of the formula



(IV)

in which R^c represents hydrogen, lower alkyl, aryl-lower alkyl or tri-substituted silyl wherein the substituents are lower alkyl, cycloalkyl, aryl or aryl-lower alkyl, if R^c is other than hydrogen or R^a represents a group $COOR^b$ and R^b is other than hydrogen, and decarboxylating if R^a is a group $COOR^b$, and, if R^4 represents halogen, treating with a reagent which exchanges halogen for a radical R^2 as defined above;

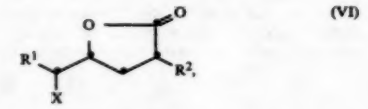
haloactonizing the resulting compound of the formula



(V)

a carboxamide or a hydroxamic acid ester thereof, with a halogenating agent;

treating the resulting compound of the formula



(VI)

in which X represents halogen, with a reagent which exchanges halogen for azido, isocyanato, readily cleavable secondary or tertiary amino or imido, hydrazino, cynamino or guanidino;

and, in the resulting compound, opening the lactone ring with a compound that introduces a radical R^3, and converting the nitrogen-containing radical X into an amino group.

4,898,978

PROCESS FOR THE PREPARATION OF N,N'-DISUBSTITUTED GUANIDINES

Manfred Bergfeld, Erlenbach-Mechenhard; Ludwig Eisenhuth, Obernburg, and Hans Zengel, Kleinwallstadt, all of Fed. Rep. of Germany, assignors to Akzo N.V., Arnhem, Netherlands

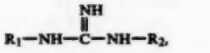
Filed Jan. 17, 1986, Ser. No. 819,881

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1985, 3501383

Int. Cl.[4] C07C *128/00*

U.S. Cl. 564—231 11 Claims

1. A process for the preparation of an N,N'-disubstituted guanidine having the formula:



wherein R_1 and R_2 may be the same or different and represent an unsubstituted or a mono- or polysubstituted aromatic group, said process comprising reacting a corresponding N,N'-disubstituted thiourea with ammonia and oxygen or an oxygen-containing gas, in the presence of a solvent and at least one catalyst selected from the group consisting of elements with atomic numbers 21 through 30 in the Periodic Table, lanthanides, and salts, oxides, and complexes thereof.

4,898,979

PROCESS FOR PREPARING 1,3,5-TRIAZINETRIONES

Bernd Gallenkamp, Wuppertal; Andreas Günther, Cologne; Karl-Heinrich Mohrmann, Bergisch-Gladbach, and Thomas Schmidt, Haan, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

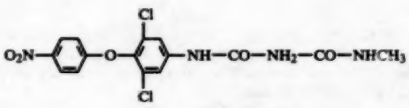
Division of Ser. No. 858,407, May 1, 1987, abandoned. This application Sep. 8, 1987, Ser. No. 94,195

Claims priority, application Fed. Rep. of Germany, May 9, 1985, 3516732

Int. Cl.[4] A61K *31/165*; C07C *102/06*

U.S. Cl. 564—418 6 Claims

1. The biuret of the formula



4,898,980

PROCESS FOR PREPARING DITHIOBISPHENOLS

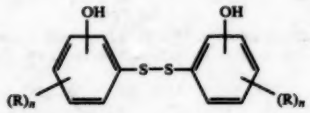
Linda A. Benjamin, Horsham, Pa.; Stephen D. Pastor, Basel, Switzerland, and John J. Luzzi, Carmel, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 29, 1988, Ser. No. 212,852

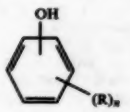
Int. Cl.[4] C07C *148/02*

U.S. Cl. 568—23 6 Claims

1. A process of preparing compounds of the formula



wherein R is C_1–C_8 alkyl, C_5–C_{12} cycloalkyl, C_7–C_9 aralkyl or C_7–C_9 aralkyl substituted by C_1–C_{12} alkyl and n is 1–3, which comprises reacting a phenol of the formula



wherein R and n are as previously defined with sulfur monochloride in the presence of equimolar amounts ±10% and greater than 30 weight %, relative to the phenol, of an aliphatic or heterocyclic amine.

4,898,981

HETEROATOM CONTAINING PERFLUOROALKYL TERMINATED NEOPENTYL GLYCOLS AND COMPOSITIONS THEREFROM

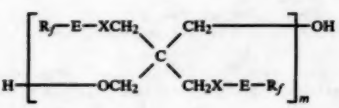
Robert A. Falk, New City, N.Y.; Kirtland P. Clark, Bethel, Conn., and Athanasios Karydas, Brooklyn, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 20, 1988, Ser. No. 209,743

Int. Cl.[4] C07C *147/00*

U.S. Cl. 568—28 12 Claims

1. A compound of formula I



(I)

wherein

R_f is a straight or branched chain perfluoroalkyl of 1 to 18 carbon atoms or said perfluoroalkyl substituted by perfluoroalkoxy of 2 to 6 carbon atoms,

E is branched or straight chain alkylene of 1 to 10 carbon atoms or said alkylene interrupted by one to three groups selected from the group consisting of —NR—, —O—, —S—, —SO_2—, —COO—, —OOC—, —CONR— and —SO_2NR—,

X is —S— or —SO_2—, and

where R is independently hydrogen, alkyl of 1 to 6 carbon atoms or hydroxyalkyl of 1 to 6 carbon atoms, and

m is 1 to 3.

4,898,982

PREPARATION OF DIARYL ETHERS AND DIARYL SULFIDES

Gregory P. Hussmann, Batavia, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Nov. 16, 1987, Ser. No. 121,151

Int. Cl.[4] C07C *148/00, 43/275*

U.S. Cl. 568—58 14 Claims

1. A method for the formation of a diaryl ether or a diaryl sulfide comprising heating a phenol, a thiophenol, a β-hydroxy-substituted fused aromatic ring-system compound, or a β-thio-substituted fused aromatic ring-system compound in the gas phase at a temperature in the range of from about 300° C. to about 600° C. in the presence of a bed of catalyst particles comprising thorium oxide deposited on a support selected from the group consisting of pure silica, pure zirconia, carbon, asbestos and quartz.

4,898,983

PREPARATION OF ARYL CARBONYL COMPOUNDS

Ian D. H. Towle, Cirencester, England, assignor to Raychem Limited, London, England

Continuation of Ser. No. 96,416, Sep. 11, 1987, abandoned. This application Nov. 7, 1988, Ser. No. 270,401

Claims priority, application United Kingdom, Sep. 30, 1986, 8623510

Int. Cl.[4] C07C 45/46

U.S. Cl. 568—322 17 Claims

1. A method of preparing an aryl carbonyl compound which comprises reacting phosgene or a mono-, di-, or polyfunctional organic carboxylic acid, acid halide, alkyl ester or anhydride together with an aromatic comonomer containing at least one activated hydrogen atom in a reaction medium comprising:

(A) a Lewis acid;

(B) a controlling agent comprising:

(i) $R(OX)_a$ which must be present in the reaction medium together with the Lewis acid before any reactant containing acid halide groups is added,

(ii) $R(COOX)_a$, or

(iii) $(RO)_bY$, which, if the Y—O linkage(s) are reactive to acid halide groups, must be present in the reaction medium together with the Lewis acid before any reactant containing acid halide groups is added,

where R is a monovalent or polyvalent organic group compatible with the reactant(s) and the other components of the reaction medium,

each X independently is a hydrogen atom or a monovalent metal atom,

each a independently is 1 or 2,

Y is a multivalent metal atom, and

b is an integer equal to the valency of Y; and

(C) optionally a non-protic diluent;

the various component being present in such proportions and the reaction being conducted under such conditions that a para substituted carbonyl compound substantially free of by-products resulting from alkylation and/or ortho substitution is obtained.

4,898,984

PROCESS FOR PREPARING 3,5,5,-TRIMETHYL-4-HYDROXY-2-CYCLOHEXEN-1-ONE

Hans Bellut, Duelmen, Fed. Rep. of Germany, assignor to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Nov. 30, 1988, Ser. No. 278,232

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1988, 3806835

Int. Cl.[4] C07C 45/28

U.S. Cl. 568—342 9 Claims

1. A process for preparing 3,5,5-trimethyl-4-hydroxy-2-cyclohexen-1-one, comprising:

oxidizing beta-isophorone in the presence of aqueous hydrogen peroxide and formic acid at a temperature in the range of 0°–100° C., wherein said hydrogen peroxide and said acid are present in a molar ratio of about 1:1 to about 5:1.

4,898,985

PROCESS FOR PREPARING 3,5,5-TRIMETHYLCYCLOHEXA-2-EN-1,4-DIONE

Nobuhiko Ito; Kimio Kinoshita; Kiyonori Suzuki, and Takeaki Eto, all of Chiba, Japan, assignors to Soda Aromatic Company, Limited, Japan

Filed Oct. 6, 1988, Ser. No. 254,212

Claims priority, application Japan, Oct. 6, 1987, 62-250625

Int. Cl.[4] C07C 45/34

U.S. Cl. 568—344 10 Claims

1. A process for preparing 3,5,5-trimethylcyclohexa-2-en-1,4-dione comprising oxidizing 3,5,5-trimethylcyclohexa-3-en-one with molecular oxygen or a molecular oxygen-containing gas in the presence of an alkylamine and an organometallic complex catalyst selected from the group consisting of a porphyrin complex of manganese, cobalt, iron or copper, a substituted porphyrin complex of manganese, cobalt, iron or copper, a phthalocyanine complex of manganese, cobalt, iron or copper and a substituted phthalocyanine complex of manganese, cobalt, iron or copper.

4,898,986

INOSOSE DERIVATIVES, PRODUCTION AND USE THEREOF

Satoshi Horii, and Hiroshi Fukase, both of Osaka, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

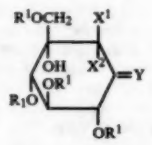
Filed Aug. 31, 1987, Ser. No. 90,974

Claims priority, application Japan, Sep. 9, 1986, 61-212952; Nov. 5, 1986, 61-263462; Jan. 6, 1987, 62-779

Int. Cl.[4] C07C 49/497

U.S. Cl. 568—376 2 Claims

1. A compound of the formula:



wherein X^1 and X^2 are both halogen; X^1 is hydrogen and X^2 is halogen; or X^1 is $—SQ^1$ and X^2 is $—SQ^2$, wherein each of Q^1 and Q^2 is lower alkyl or Q^1 and Q^2 can form lower alkylene R^1 is a protective group for hydroxyl and Y is =O, =N—Z, wherein Z is a hydroxyl, hydroxyl protected group, or

wherein A is hydrogen or a C_{1-7} acyclic or cyclic hydrocarbon, which can include at least one substituent selected from the group consisting of hydroxyl, hydroxyl protected and phenyl.

4,898,987

METHOD FOR PRODUCTION OF PHENOL/ACETONE FROM CUMENE HYDROPEROXIDE

John F. Knifton, Austin, Tex., assignor to Texaco Chemical Company, White Plains, N.Y.

Filed Mar. 17, 1989, Ser. No. 324,118

Int. Cl.[4] C07C 45/53

U.S. Cl. 568—385 22 Claims

1. In a method for cosynthesis of phenol and acetone by acid-catalyzed decomposition over a catalyst, the improvement comprising reacting cumene hydroperoxide over an acidic montmorillonite clay catalyst which has been modified by the use of a material from the group consisting of heteropoly acids, titanium, zirconium or aluminum at a temperature of about 20° C. to 150° C. and a pressure of from zero to 1000 psig.

4,898,988

PROCESS FOR THE PREPARATION OF β-HYDROXYKETONES

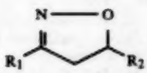
You-Jyh Lin, Columbia, and Harold Kloczewski, Pasadena, both of Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Mar. 13, 1989, Ser. No. 322,259

Int. Cl.[4] C07C 45/56

U.S. Cl. 568—386 9 Claims

1. A process for the preparation of β-hydroxyketones comprising: the catalytic hydrogenolysis of an aqueous solution of isoxazolines having the formula



together with a stream of hydrogen in a fixed-bed reactor containing a transition metal catalyst at a temperature from about 20° to 150° C. and a pressure from about 0 to 150 psig; wherein R_1 and R_2 are independently selected from hydrogen, alkyl, cycloalkyl or aromatic group; and wherein the aqueous solution of isoxazolines is substantially free of acids or buffers.

4,898,989

ALKANE OXIDATION PROCESS

Paul E. Ellis, Jr., Downingtown, and James E. Lyons, Wallingford, both of Pa., assignors to Sun Refining and Marketing Company, Philadelphia, Pa.

Filed Oct. 7, 1988, Ser. No. 254,750

Int. Cl.⁴ C07C *45/33*

U.S. Cl. 568—399 **14 Claims**

1. In an oxidation process in which an alkane is contacted with air or oxygen at about 50°-350° C. and in the presence of a catalytically effective amount of a heteropolyacid having the formula (I) $H_e(X_kM_nO_y)^{-e}$, where X is a group IIIA-VIA atom, M is molybdenum, tungsten, vanadium, or combinations thereof, k is 1-5, n is 5-20, and y is 18-62, or polyoxoanions thereof, the improvement which comprises replacing three atoms of M with three different metal atoms, M', to yield a catalyst having the formula (II) $H_e(X_kM_nM'_3O_y)^{-e}$ where X, k, and M are as above, n is 5-17, y is 18-59, M' is zinc or a transition metal, and wherein M' is free of double-bonded oxygen atoms and each M' atom is bonded through oxygen to another M' atom; or polyoxoanions thereof.

4,898,990

PROCESS FOR THE EXTRACTION OF VANILLIN

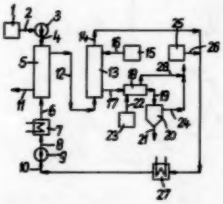
Hubert Coenen, Essen, and Reinhard Konrad, Bochum, both of Fed. Rep. of Germany, assignors to Fried. Krupp GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 57,895, Jul. 16, 1987. This application Dec. 27, 1988, Ser. No. 289,516

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1985, 3533562

Int. Cl.⁴ C07C *45/90*

U.S. Cl. 568—438 **7 Claims**



1. Process for the extraction of vanillin by means of extraction from a vanillin-containing, water-containing, liquid mixture of substances with carbon dioxide at a temperature of 0 to 110? C. as well as a pressure of 30 to 400 bar and subsequent separation of the vanillin from the vanillin-containing carbon dioxide, comprising: passing the vanillin-containing carbon dioxide at the extraction temperature and the extraction pressure through an aqueous $NaHSO_3$, $KHSO_3$, Na_2SO_3, or K_2SO_3 solution to separate the vanillin from the carbon dioxide and form a vanillin-containing aqueous $NaHSO_3$, $KHSO_3$, Na_2SO_3 or K_2SO_3 solution and a vanillin-free carbon dioxide, subsequently acidifying the vanillin-containing $NaHSO_3$, $KHSO_3$, Na_2SO_3 or K_2SO_3 solution with sulfuric acid to a pH value of 2 to 4, and feeding the vanillin-free carbon dioxide back into the extraction stage.

4,898,991

NEW PERFLUOROPOLYETHERS

Hsu-Nan Huang, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 30, 1989, Ser. No. 303,151

Int. Cl.⁴ C07C *43/12*

U.S. Cl. 568—615 **8 Claims**

1. Perfluoropolyether compounds of the formula:

$$F(CF_2)_aO[(CF_2)_b\underset{R}{\underset{|}{C}}FCF_2O]_cCF_2CF_2O(CF_2)_dF$$

where:

a=1-6;

b=0-2, with the proviso that when b=0, R=CF_3, and when b=1 or 2, R=F;

c=0-8; and

d=5-18.

4,898,992

PROCESS FOR THE PREPARATION OF ALKYLENE GLYCOL DIALKYL ETHERS

Achim Stankowiak, Burgkirchen, and Hildegard Schulz, Triftern, both of Fed. Rep. of Germany, assignors to Hoechst AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 26, 1989, Ser. No. 302,401

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1988, 3802783

Int. Cl.⁴ C07L *41/01*

U.S. Cl. 568—618 **5 Claims**

1. A process for the preparation of alkylene glycol dialkyl ethers from alkylene glycol monoalkyl ethers having a secondary hydroxyl group, which comprises reacting an alkylene glycol monoalkyl ether of the formula I

$$R^1O(CH_2\underset{R^2}{\underset{|}{C}}HO)_n—CH_2\underset{R^3}{\underset{|}{C}}HOH$$

in which R^1 is an alkyl radical having 1 to 25 carbon atoms, R^2 is H, CH_3 or C_2H_5 and, within the chain of the polyoxyalkylene radical, arranged randomly or in blocks, can also assume all three meanings, R^3 is CH_3 or C_2H_5 and n denotes 1 to 100, with hydrogen without pressure in the presence of nickel on a support as catalyst and recovering the alkylene glycol dialkyl ether formed from the reaction product.

4,898,993

PROCESS FOR PREPARING 2-TERT-BUTYL-4-METHOXYPHENOL

Abram Becker, Paris, France; Nurit Kornberg, and Berta Croitoru, both of Beer-Sheva, Israel, assignors to Bromine Compounds Limited, Israel

Filed Jan. 13, 1988, Ser. No. 143,403

Claims priority, application Israel, Jan. 21, 1987, 81339

Int. Cl.⁴ C07C *41/06*

U.S. Cl. 568—658 **10 Claims**

1. A process for the preparation of 2-tert-butyl-4-methoxyphenol comprising reacting 4-bromo-2-tert-butylphenol with a methoxide in an organic solvent, in the presence of a formamide and a catalyst selected from the group consisting of:

(a) a catalytic system comprising a mixture of from about 0.5% to about 1% copper, from about 0.9% to about 3.6% cuprous bromide, from about 0.25% to about 1% bronze, from about 0.25% to about 1% potassium iodide, based upon the weight of said 4-bromo-2-tert-butylphenol; and

(b) a catalytic system comprising a mixture of from about 1.0% to about 5% copper hydroxycarbonate, and from about 2% to about 10% sodium sulphite based upon the weight of said 4-bromo-2-tert-butylphenol.

4,898,994

PROCESS FOR MAKING 3,5-DIALKYL-4-HYDROXYBENZYL-SUBSTITUTED AROMATICS

Glen L. Livingston, Church Hill, Tenn.; John Borges, and George L. Mina, both of Orangeburg, S.C., assignors to Ethyl Corporation, Richmond, Va.

Filed Oct. 14, 1988, Ser. No. 257,981

Int. Cl.[4] C07C *37/11, 39/12*

U.S. Cl. 568—720 11 Claims

1. A two-stage process for making a 3,5-di-C_{1-20}alkyl-4-hydroxybenzyl-substituted alkylbenzene compound, said process comprising a first stage of forming a mixture of said alkylbenzene compound and a 2,6-di-C_{1-20}-alkyl-4-methoxymethylphenol in an inert solvent, the amount of said 2,6-di-C_{1-20}-alkyl-4-methoxymethylphenol being about 30–60 weight percent of the total 2,6-di-C_{1-20}-alkyl-4-methoxymethylphenol used in the process and feeding sulfuric acid to said mixture at a temperature of about −10° to 25° C. to form a first stage reaction mixture and a second co-feed stage of co-feeding (i) the remaining 40–70 weight percent of the 2,6-di-C_{1-20}-alkyl-4-methoxymethylphenol and (ii) sulfuric acid to form a final reaction mixture and recovering said 3,5-di-C_{1-20}-alkyl-4-hydroxybenzyl-substituted alkylbenzene compound from said final reaction mixture.

4,898,995

METHOD FOR PRODUCTION OF PHENOL/ACETONE FROM CUMENE HYDROPEROXIDE

John F. Knifton, Austin, and John R. Sanderson, Leander, both of Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Filed Oct. 24, 1988, Ser. No. 261,817

Int. Cl.[4] C07C *37/08, 45/53*

U.S. Cl. 568—798 15 Claims

1. In a method for cosynthesis of phenol and acetone by acid-catalyzed decomposition over a catalyst, the improvement comprising reacting cumene hydroperoxide over a heterogeneous catalyst consisting essentially of a heteropoly acid on an inert support at a temperature of about 20° to 150° C. and a pressure of from zero to 1000 psig.

4,898,996

PROCESS FOR PRODUCING 3-CHLORO-4-FLUORONITROBENZENE

Tsukasa Ishikura, Ageo, and Tatuharu Fukushima, Yono, both of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP88/00283, § 371 Date Jun. 23, 1988, § 102(e) Date Jun. 23, 1988, PCT Pub. No. WO88/07519, PCT Pub. Date Oct. 6, 1988

PCT Filed Mar. 18, 1988, Ser. No. 229,175

Claims priority, application Japan, Mar. 25, 1987, 62-68792; Apr. 14, 1987, 62-89751

Int. Cl.[4] C07C *79/12, 17/12*

U.S. Cl. 568—938 3 Claims

1. A process for producing 3-chloro-4-fluoronitrobenzene comprising chlorinating 4-fluoronitrobenzene in the presence of:

(1) iodine or an iodide in combination with iron or an iron compound or

(2) iodine or an iodide in combination with antimony or an antimony compound.

4,898,997

HALOPHENYLETHYLENES

Raymond V. H. Jones, Linlithgow, and Ian G. C. Fleming, Kirkliston, both of Scotland, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 862,656, May 13, 1986, abandoned, which is a continuation of Ser. No. 675,469, Nov. 28, 1984, abandoned, which is a continuation of Ser. No. 370,813, Apr. 22, 1982, abandoned. This application Dec. 20, 1988, Ser. No. 287,628

Claims priority, application United Kingdom, May 12, 1981, 8114395

Int. Cl.[4] C07C *17/24, 21/18, 33/24*

U.S. Cl. 570—128 3 Claims

1. 1-(2-chlorophenyl)-1-(4-fluorophenyl)ethane.

2. 1-(2-fluorophenyl)-1-(4-fluorophenyl)ethane.

3. 1-(2,4-dichlorophenyl)-1-(4-fluorophenyl)ethane.

4,898,998

PROCESS FOR PRODUCING BROMINATED ACENAPHTHYLENE CONDENSATES

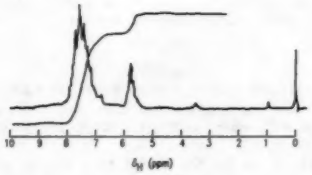
Masashige Kubo; Hideo Sakka, and Yukihiro Tsutsumi, all of Yamaguchi, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shinnanyo, Japan

Filed May 31, 1984, Ser. No. 615,541

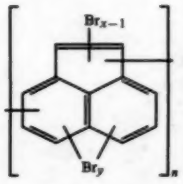
Claims priority, application Japan, Jun. 1, 1983, 58-95830; Oct. 28, 1983, 58-201119; Oct. 29, 1983, 58-201920; Nov. 15, 1983, 58-213326; Dec. 27, 1983, 58-244796; Feb. 23, 1984, 59-31451

Int. Cl.[4] C07C *17/00*

U.S. Cl. 570—204 13 Claims



1. A process for producing brominated acenaphthylene condensates of the formula:



wherein x is 1 or 2, y is an integer from 1 to 6 and n is 2 or more, comprising:

(A) brominating the side chain of the acenaphthene with 0.2 to 2.0 times as many moles of bromine as acenaphthene, said bromination initiated by ultraviolet radiation or by a radical initiator in a halogenated hydrocarbon solvent;

(B) adding a Lewis acid catalyst to the reaction solution in step (A) to promote the condensation of the brominated acenaphthene product of step (A);

(C) adding to the reaction solution of step (B) an equimolar or more amount of bromine relative to the amount of acenaphthene starting material, to further brominate and simultaneously condense the brominated acenaphthene and/or brominated acenaphthene condensates; and

(D) dehydrobrominating the brominated acenaphthene condensates.

4,898,999

PROCESS FOR HALOGENATING CYCLOBUTENOARENES

Larry S. Corley, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 3, 1988, Ser. No. 201,818
Int. Cl.[4] C07C 17/12, 17/04
U.S. Cl. 570—207 18 Claims

1. A process for preparing a cyclobutenohaloarene comprising the steps of:

(a) providing a reaction mixture comprising an organic phase and an aqueous phase, the organic phase comprising a cyclobutenoarene;

(b) contacting in the organic phase the cyclobutenoarene and a halogen source, said halogen source selected from sources of chlorine and bromine, under reaction conditions effective for producing a reaction product comprising the cyclobutenohaloarene and hydrogen halide and for permitting migration of the halogen halide into the aqueous phase; and

(c) recovering the cyclobutenohaloarene from the organic phase.

4,899,000

PRODUCTION OF ALLYL CHLORIDE

John E. Stauffer, 6 Pecksland Rd., Greenwich, Conn. 06831

Filed Jan. 27, 1989, Ser. No. 303,498
Int. Cl.[4] C07C 17/02, 17/34, 17/15
U.S. Cl. 570—222 11 Claims

1. A process for the production of allyl chloride using hydrogen chloride as a source of chlorine, said process including reaction steps operated in tandem;

first subjecting perchloroethylene to oxychlorination with hydrogen chloride and oxygen in the presence of an oxychlorination catalyst to give reaction products consisting essentially of hexachloroethane and water;

second, isolating and reacting said hexachloroethane with a hydrocarbon containing three carbon atoms and optionally added chlorine, in the vapor phase to produce a product stream comprising predominantly allyl chloride, perchloroethylene and hydrogen chloride; and

third, isolating said products of the second step and repeating the first step using as starting materials the perchloroethylene and hydrogen chloride thus isolated whereby chlorination using regenerated hexachloroethane is accomplished, the process being operated with total utilization of hydrogen chloride and net production of hydrogen chloride and hexachloroethane is avoided.

4,899,001

PROCESS FOR THE SIMULTANEOUS HYDROCONVERSION OF A FIRST FEEDSTOCK COMPRISING UNSATURATED, HALOGENATED ORGANIC COMPOUNDS AND A SECOND FEEDSTOCK COMPRISING SATURATED, HALOGENATED ORGANIC COMPOUNDS

Tom N. Kalnes, La Grange, and Robert B. James, Jr., Northbrook, both of Ill., assignors to UOP, Des Plaines, Ill.

Filed Nov. 21, 1988, Ser. No. 274,225
Int. Cl.[4] C10C 1/00
U.S. Cl. 585—310 12 Claims

1. A process for the simultaneous hydrodehalogenation of a first feedstock comprising unsaturated, halogenated organic compounds and a second feedstock comprising saturated, halogenated organic compounds which process comprises:

(a) reacting said first feedstock comprising unsaturated, halogenated organic compounds with hydrogen in a first hydrogenation reaction zone operated at hydrogenation conditions selected to minimize the polymerization of unsaturated organic compounds and to produce a first hydrogenated stream comprising hydrocarbonaceous compounds;

(b) reacting at least a portion of said first hydrogenated stream comprising hydrocarbonaceous compounds and said second feedstock comprising saturated, halogenated organic compounds with hydrogen in a second hydrogenation reaction zone operated at hydrogenation conditions selected to produce a second hydrogenated stream comprising hydrocarbonaceous compounds and to generate at least one water-soluble inorganic halide compound;

(c) contacting the resulting effluent from said second hydrogenation zone containing hydrogenated hydrocarbonaceous compounds and at least one water-soluble inorganic halide compound with a halide-lean aqueous scrubbing solution; and

(d) introducing a resulting admixture of said effluent from said second hydrogenation zone and said halide-lean aqueous scrubbing solution into a separation zone to provide a hydrogen-rich gaseous stream, a third hydrogen-ated stream comprising hydrocarbonaceous compounds and a halide-rich aqueous scrubbing solution containing at least a portion of said water-soluble inorganic halide compound.

4,899,002

INTEGRATED STAGED CONVERSION OF METHANOL TO GASOLINE AND DISTILLATE

Mohsen N. Harandi, Lawrenceville, and Hartley Owen, Belle Mead, both of N.J., assignors to Mobil Oil Corp., New York, N.Y.

Filed Jul. 25, 1988, Ser. No. 223,657
Int. Cl.[4] C07C 1/24, 2/12
U.S. Cl. 585—312 9 Claims

1. An integrated fluidized bed process for the conversion of C_1–C_5 oxygenate feedstock to olefinic gasoline range hydrocarbons and heavier distillate range hydrocarbons comprising the steps of:

(a) contacting said C_1–C_5 oxygenate feedstock with shape selective medium pore metallosilicate catalyst in an oxygenate to light olefins conversion zone under oxygenate to light olefins conversion conditions whereby an effluent stream comprising C_2+ olefins is produced;

(b) cooling said effluent stream and passing said effluent stream to an olefins to gasoline conversion zone in contact with shape selective medium pore metallosilicate catalyst under olefins to gasoline conversion conditions whereby C_2+ olefins are converted to gasoline comprising C_5+ olefinic hydrocarbons;

(c) introducing said C_5+ hydrocarbons into an olefins to gasoline and heavier distillate range hydrocarbons conversion zone at increased pressure under olefins to gasoline and heavier distillate range hydrocarbon conversion conditions in contact with shape selective medium pore metallosilicate catalyst whereby olefinic gasoline and heavier distillate range hydrocarbons are produced without recycling C_3–C_4 hydrocarbons to said olefins to gasoline and heavier distillate range hydrocarbons conversion zone.

4,899,003

PROCESS FOR OXYDEHYDROGENATION OF ETHANE TO ETHYLENE

Robert M. Manyik, St. Albans; Jonathan L. Brockwell, South Charleston, and John E. Kendall, Charleston, all of W. Va., assignors to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.

Filed Jul. 11, 1985, Ser. No. 753,975
Int. Cl.[4] C07C 5/333
U.S. Cl. 585—313 20 Claims

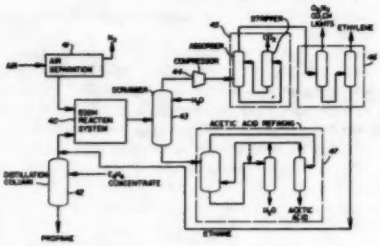
1. A process for converting ethane to ethylene, in a reaction system comprising:

at least two stages connected in open continuous series relationship with each other;

each stage comprising an oxydehydrogenating catalyst system maintained at conditions for catalytically converting an input gaseous stream comprising ethane and oxygen to an output gaseous stream having a temperature greater than 250° C. and comprising ethylene, acetic acid, water, ethane, and oxygen;

comprising the steps of:

cooling the output gaseous stream of each stage other than the output gaseous stream of the last stage to a temperature of less than about 250° C. for the introduction of oxygen;



changing the total water and acetic acid content in the input gaseous stream of at least one stage with respect to the total water and acetic acid content in the output gaseous stream immediately preceding that stage; and

supplying oxygen to the input gaseous stream of each stage when the input gaseous stream is at a temperature of less than about 250° C. and in an amount such that the total oxygen content of the input gaseous stream of each stage is less than about 6 mole percent with respect to the total input gaseous stream of that stage.

4,899,004

PROCESS FOR PRODUCING TRIMETHYLBENZENE

Joe D. Allison, and Richard M. Tillman, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Sep. 9, 1988, Ser. No. 242,110

Int. Cl.[4] C07C 2/00, 2/08

U.S. Cl. 585—321 **22 Claims**

1. A process for selectively producing trimethylbenzene which comprises:

(a) contacting a C_1 to C_4 alkane with magnesium at a temperature of from about 450° C. to about 650° C., a pressure of from about atmospheric pressure to about 100 psig and a contact time of from about 0.01 to about 10 ml of alkane per minute per gram of magnesium;

(b) contacting the reaction product or a fraction thereof produced in step (a) with water or alcohol to promote a protonolysis reaction; and

(c) contacting the reaction mixture or fraction thereof produced in step (b) with a Y zeolite catalyst containing a metal selected from a Group VIB metal or a Group VIII metal and mixtures thereof at a temperature of from about 50° C. to about 250° C., a pressure of from about atmospheric pressure to about 50 psig and a contact time of from 0.01 to about 10 ml of reaction mixture or fraction thereof per minute per gram of Y zeolite catalyst.

4,899,005

METHOD FOR PREPARING CYCLOOLEFIN COPOLYMERS WITH IMPROVED HEAT STABILITY

Parley C. Lane, Cuyahoga Falls; Linwood P. Tenney, Hudson; George M. Benedikt, Macedonia, and Paul T. Stricharczuk, Mayfield Heights, all of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Nov. 19, 1987, Ser. No. 122,849

Int. Cl.[4] C07C 2/76, 13/28

U.S. Cl. 585—360 **19 Claims**

1. A method for increasing the molecular weight and number of ring structures of one or more cycloolefin monomers comprising:

providing a volume of one or more cycloolefin monomers of sufficient purity to provide a degree of conversion to cycloolefin monomers greater than 95% upon polymerization with a metathesis catalyst system, said cycloolefin monomers having at least one norbornene group and

heating said volume of one or more cycloolefin monomers to a temperature in the range of 130° C. to 200° C. for a period of at least 0.25 hours to dissociate a portion of said cycloolefin monomers and react the dissociation products with components of said volume of cycloolefin monomers;

wherein said volume of one or more cycloolefin monomers is maintained substantially free of a polymerization catalyst and co-catalyst system during heating and the heated volume of one or cycloolefin monomers is of sufficient purity to provide a degree of monomer conversion greater than 95% upon polymerization with a methathesis catalyst system, wherein the degree of monomer conversion to polymer is determined by thermal gravimetric analysis of weight loss upon heating a polymerized sample up to about 400° C.

4,899,006

PRODUCTION OF AROMATICS FROM ETHANE AND/OR ETHYLENE

Dilip Davé , London, and Antony H. P. Hall, Cobham, both of England, assignors to The British Petroleum Company P.L.C., London, England

Filed Oct. 7, 1981, Ser. No. 309,440

Claims priority, application United Kingdom, Oct. 11, 1980, 8032910

Int. Cl.[4] C07C 12/02, 12/42

U.S. Cl. 585—415 **11 Claims**

1. A process for producing aromatic compounds which comprises contacting under conversion conditions, a gaseous paraffinic hydrocarbon feed containing ethane, with a catalyst comprising gallium and a crystalline zeolite characterized by a constraint index within the approximate range of 2 to 8.7 and a silica to alumina ratio of at least 5, the weight of gallium in said catalyst being between about 0.05 to about 10 percent based on the total weight of catalyst whereby ethane present in said gaseous feed is converted to aromatic compounds, and recovering said aromatic compounds as liquids.

4,899,007

AROMATIC CONVERSION REACTIONS WITH ZEOLITIC CATALYST COMPOSITION OF IMPROVED SHAPE SELECTIVITY

Pochen Chu, West Deptford, N.J.; Francis G. Dwyer, West Chester, and Albert B. Schwartz, Philadelphia, both of Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 533,893, Sep. 21, 1983, abandoned, which is a continuation of Ser. No. 454,302, Dec. 29, 1982, abandoned, which is a continuation of Ser. No. 7,871, Jan. 31, 1979, abandoned. This application Dec. 10, 1984, Ser. No. 679,673

Int. Cl.[4] C07C 2/68

U.S. Cl. 585—467 **17 Claims**

1. A conversion process for the alkylation of a monoalkyl

aromatic with an olefin to produce a dialkyl aromatic in which the para-isomer is in excess of its normal equilibrium concentration which comprises contacting said monoalkyl aromatic and said olefin under conditions effective for accomplishing said alkylation in the presence of a zeolite which has been calcined at an elevated temperature of at least 649° C., said zeolite being characterized by a silica/alumina ratio of at least about 12 and a constraint index within the approximate range of 1 to 12.

4,899,008

DIRECT CATALYTIC ALKYLATION OF MONONUCLEAR AROMATICS WITH LOWER ALKANES

Rene B. LaPierre, Medford, and Roger A. Morrison, Deptford, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 205,563, Jun. 7, 1988, abandoned, which is a continuation of Ser. No. 64,630, Jun. 22, 1987, abandoned, which is a continuation-in-part of Ser. No. 879,786, Jun. 27, 1986, abandoned. This application Mar. 16, 1989, Ser. No. 324,483

Int. Cl.[4] C07C *2/68*

U.S. Cl. 585—467 **20 Claims**

1. A process for producing alkylaromatics which comprises reacting a mononuclear aromatic compound and a C_2–C_4 paraffin in the presence of an acidic, intermediate pore size zeolite catalyst under substantially non-cracking conditions for the paraffin to produce C_{7+} alkylaromatic products with a selectivity of at least 60 weight percent.

4,899,009

METHOD FOR PRODUCING M-BENZYLTOLUNE

Shigenobu Kawakami, Ichikawa; Keiji Endo, Yokosuka; Hideyuki Dohi, Yokohama, and Atsushi Sato, Tokyo, all of Japan, assignors to Nippon Petrochemicals Co. Ltd., Tokyo, Japan

Continuation of Ser. No. 289,416, Dec. 21, 1988, abandoned, which is a continuation of Ser. No. 159,102, Feb. 23, 1988, abandoned. This application Jun. 9, 1989, Ser. No. 364,490

Claims priority, application Japan, Sep. 9, 1987, 62-226214; Dec. 29, 1987, 62-332856

Int. Cl.[4] C07C *5/22*

U.S. Cl. 585—471 **5 Claims**

1. A method for producing m-benzyltoluene which is characterized in that toluene and diphenylmethane are allowed to react at a reaction temperature in the range of 170 to 400° C. in the presence of a crystalline synthetic zeolite catalyst in which the molar ratio of SiO_2/Al_2O_3 is 20 or higher and the openings of main pores are formed by ten-membered oxygen rings.

4,899,010

PROCESS FOR ISOMERIZATION OF UNEXTRACTED, ETHYLBENZENE-CONTAINING XYLENE FEEDS

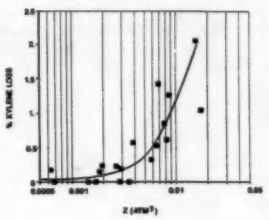
Jeffrey A. Amelse, Batavia, and Mark G. Reichmann, Oak Park, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Sep. 29, 1988, Ser. No. 250,933

Int. Cl.[4] C07C *5/22*

U.S. Cl. 585—480 **11 Claims**

1. In a vapor-phase process to isomerize, in the presence of hydrogen, a stream containing a major amount of one or more xylenes and a minor amount of ethylbenzene and primarily C_9 paraffins and naphthenes to a mixture rich in paraxylene, the improvement comprising isomerizing said feed over a catalyst composition that is a supported, crystalline, silicate molecular sieve having pores defined by rings containing ten oxygen atoms and containing a heteroatom selected from the group consisting of boron, aluminum, iron and gallium, said heteroatom present in a ratio of about one heteroatom for each twelve to five hundred silicon atoms, which catalyst composition is impregnated with about 0.02 to about 5 weight percent platinum, calculated as the metal, at a temperature T between about 700 and about 1000° F., a total pressure P between ambient and about 100 psig, and a hydrogen/hydrocarbon mol ratio H/HC between about 0.25 and about 5, such that T, P, and



H/HC are chosen so that Z, a function of T, P and H/HC, is less than about 0.01.

4,899,011

XYLENE ISOMERIZATION PROCESS TO EXHAUSTIVELY CONVERT ETHYLBENZENE AND NON-AROMATICS

Yung F. Chu, Cherry Hill, N.J.; Charles T. Kresge, Ellicott City, Md., and Rene B. LaPierre, Medford, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 15, 1986, Ser. No. 819,072

Int. Cl.[4] C07C *5/27*

U.S. Cl. 585—481 **30 Claims**

1. A process for isomerizing a feed which contains 0–20 weight percent paraffins and an aromatic C_8 mixture of ethylbenzene and xylene in which the para-xylene is less than that at thermal equilibrium which process comprises contacting the feed, under isomerization conditions, with a two component catalyst system including component (1) and component (2) wherein

component (1) comprises a zeolite of a constraint index of about 1 to about 12 and of an ortho-xylene sorption time of greater than 50 minutes based on its capacity to sorb 30% of the equilibrium capacity of ortho xylene at 120° C. and at an ortho xylene partial pressure of 4.5±0.8 mm of mercury and 0.05 to 10 wt % of a hydrogenation component and is effective, under said isomerization conditions, to deethylate benzene; and

component (2) comprises a zeolite, having a constraint index within the approximate range of 1 to 12 and characterized by a xylene sorption capacity greater than 1 gram/100 grams of zeolite and an ortho-xylene absorption time for 30 percent of said capacity of less than 10 minutes, where the sorption capacity and sorption times are measured at 120° C. and a xylene pressure of 4.5±0.8 mm of mercury; and comprises 0.05 to 10 weight percent of a hydrogenative component wherein the amount of component (2) in the catalyst system is at least 50 percent by volume of the catalyst system wherein isomerization conditions include a temperature of from about 400° to 1000° F., a pressure of from about 0 to 1000 psig, a WHSV of between 0.5 and 100 and a H_2/HC molar ratio of between about 0.5 and 10; and

whereby the ethylbenzene content of the feed is exhaustively converted,

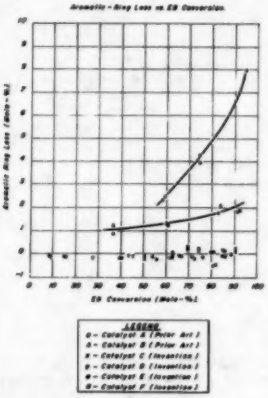
wherein exhaustively converted is deethylation of at least half the ethylbenzene and includes hydrocracking of at least one-third of said 0–20 weight percent of paraffins.

4,899,012

CATALYST FOR THE ISOMERIZATION OF AROMATICS

J. W. Adriaan Sachtler, Des Plaines, and R. Joe Lawson, Palatine, both of Ill., assignors to UOP, Des Plaines, Ill.

Filed Oct. 17, 1988, Ser. No. 259,086
Int. Cl.[4] C07C 5/22
U.S. Cl. 585—482 2 Claims



1. A process for the isomerization of a feedstock containing a non-equilibrium mixture of xylenes and ethylbenzene which comprises contacting such non-equilibrium mixture with a catalyst comprising a combination of a Group VII metal component and a lead component with a carrier material containing about 1 to about 20 mass % of a pentasil zeolite and an inorganic oxide binder, wherein the atomic ratio of lead to Group VIII metal is about 2 to about 10 and wherein about 80% to about 100% of the Group VIII metal component and about 60% to about 100% of the lead component are combined with the inorganic oxide binder, at conditions selected to isomerize xylenes and selectively dealkylate ethylbenzene.

4,899,013

VISCOUS POLYMERS OF ISOBUTYLENE AND DIENES

Kelley R. Lane, Winfield, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Oct. 20, 1988, Ser. No. 260,253
Int. Cl.[4] C07C 2/02
U.S. Cl. 585—506 6 Claims

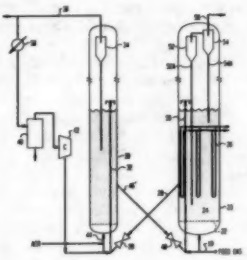
1. A process for preparation of viscous copolymer of dienes and isobutylene wherein said copolymer has a degree of unsaturation greater than 100% and an average molecular weight range of from 400 to 10,000 wherein said process comprises reacting a feed comprising isobutylene with a C_4 to C_8 diene in the presence of a catalyst comprising a Lewis acid-type catalyst wherein the volume ratio of C_4 to C_8 diene to said isobutylene is from 1:3 to about 1:20, at a temperature within the range of from about 0° C. to about 40° C., wherein weight ratio of said catalyst to said feed is from 0.02 wt % to about 0.20 wt %.

4,899,014

UPGRADING PROPENE-ETHENE MIXTURES IN A TURBULENT FLUIDIZED CATALYST BED REACTOR

Amos A. Avidan, 2120 Stackhouse Dr., Yardley, Pa. 19067; David L. Johnson, 181 Concord Meeting Rd., Glen Mills, Pa. 19342, and Jorge L. Soto, S-545 Inverness Apts., Westville, N.J. 08093

Continuation-in-part of Ser. No. 6,407, Jan. 23, 1987, Pat. No. 4,746,762. This application May 23, 1988, Ser. No. 197,546
The portion of the term of this patent subsequent to May 24, 2005, has been disclaimed.
Int. Cl.[4] C07C 2/12
U.S. Cl. 585—533 16 Claims



1. A fluidized bed catalytic process for conversion of propene-rich light olefinic gas feedstock comprising at least 2 mol % ethene and having a C_3:C_2 olefin molar ratio of at least about 2:1 to produce hydrocarbons rich in C_4+aliphatics and aromatics, comprising the steps of: maintaining a turbulent fluidized bed in a reactor operating at a pressure in the range from about 400 to 2500 kPa, and temperature of about 315 to 510° C., said catalyst being a particulate zeolite having a silica:alumina molar ratio in the range from about 20:1 to about 200:1, an apparent particle density of about 0.9 to 1.6 g/cm^3, a size range of about 1 to 150 microns, and average catalyst particle size of about 20 to 100 microns containing about 10 to 25 weight percent of fine particles having a particle size less than 32 microns;

passing hot light olefinic gas feedstock upwardly through the fluidized catalyst bed in a single pass under turbulent flow conditions which provide reaction severity conditions sufficient to convert at least about 70% of feedstock ethene and propene;

maintaining turbulent fluidized bed conditions at a superficial feedstock velocity of about 0.3 to 2 meters per second through the reactor bed; and

recovering hydrocarbon product containing a major amount of C_4+hydrocarbons, at least 6% isobutane, and containing propane and propene in a ratio in the range from about 0.1:1 to 5:1.

4,899,015

PROCESS FOR OLEFINS TO GASOLINE CONVERSION

Mohsen N. Harandi, Lawrenceville, and Hartley Owen, Belle Mead, both of N.J., assignors to Mobil Oil Corp., New York, N.Y.

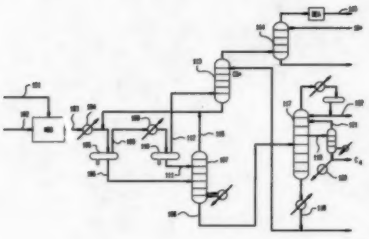
Filed Jul. 28, 1988, Ser. No. 225,432
Int. Cl.[4] C07C 2/02
U.S. Cl. 585—533 9 Claims

1. An improved process for the conversion of lower olefinic hydrocarbon feedstock to C_5+ gasoline range hydrocarbons comprising:

a. contacting a hydrocarbon stream containing C_3— and/or C_4— olefinic hydrocarbons with a medium pore shape selective solid catalyst in an oligomerization zone under

oligomerization conditions to produce an effluent stream rich in C_5+ gasoline range hydrocarbons;

b. separating said effluent stream to provide a C_3- hydrocarbon stream and a C_3+ hydrocarbon stream;



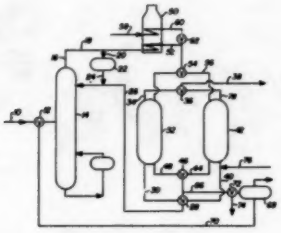
c. fractionating said C_3+ hydrocarbon stream to produce a C_5+ gasoline range hydrocarbon stream, a stream rich in C_4 hydrocarbons and a stream rich in C_3 hydrocarbons.

4,899,016

PURIFICATION PROCESS FOR ORGANIC FEEDSTOCKS

Keith R. Clark, and Philip Richman, both of Houston, Tex., assignors to UOP, Des Plaines, Ill.

Filed Feb. 11, 1988, Ser. No. 155,125
Int. Cl.[4] C07C 7/12; C10G 17/00
U.S. Cl. 585—826 **6 Claims**



1. Process for purifying an organic feedstock which comprises the steps of:

(a) passing the impure organic feedstock in the liquid phase through a fixed bed containing a molecular sieve adsorbent capable of selectively absorbing the impurity constituent to be removed, and terminating such passage prior to the time of breakthrough of an undesirable concentration of the impurity constituent;

(b) draining the bed of its void space held liquid, by displacing said liquid with vapor containing constituents of the purified product;

(c) countercurrently to the direction of flow into the bed in step (a), introducing a substantially non-sorbable purge gas into the bed at a rate which displaces the void space vapor from the bed without significant intermixing of the two gas phases and without desorbing the adsorbed impurity and collecting the displaced vapor as product;

(d) continuing the flow of the non-sorbable purge gas through the bed to desorb the adsorbed impurity and flush same from the bed and out of the adsorption-purification system;

(e) displacing the non-sorbable purge gas remaining in the bed at the termination of step (d) by the cocurrent flow, with respect to the direction of flow in step (d), thereinto of vapor phase stream comprising one or more constituents of the purified product of step (a); and

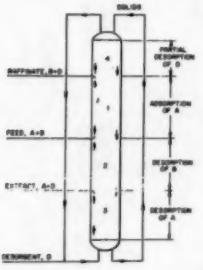
(f) countercurrently with respect to the direction of flow in step (e) displacing the void space vapor remaining in the bed in step (e) by introducing in the liquid phase a portion of the purified product from step (a) in an amount sufficient to fill the bed void space and cool the bed to the desired temperature for introducing additional impure feedstock to begin a new purification and regeneration cycle.

4,899,017

PROCESS FOR THE SELECTIVE SEPARATION OF PARA-XYLENE FROM C8 AROMATIC MIXTURES

Tsoung Y. Yan, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 27, 1987, Ser. No. 78,440
Int. Cl.[4] C07C 7/12
U.S. Cl. 585—828 **13 Claims**



1. A process for removing p-xylene from a mixture including p-xylene and at least one other C_8 aromatic compound selected from the group consisting of m-xylene, o-xylene and ethylene benzene, comprising

contacting said mixture with a bed comprising a zeolite having a SiO_2:Al_2O_3 molar ratio of at least 200 selected from the group consisting of ZSM-5, ZSM-11 and zeolite beta, at a temperature up to about 100° C. (atmospheric pressure), whereby p-xylene is adsorbed by said zeolite and said at least one other C_8 aromatic compound passes through the bed;

passing through said bed containing the zeolite and adsorbed p-xylene, a desorbent, while maintaining the temperature the same as that used during said contacting and thereby maintaining the desorbent in the liquid state; whereby desorbent leaving the bed contains p-xylene.

ELECTRICAL

4,899,018

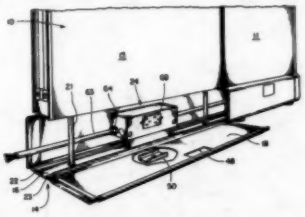
UTILITY ROUTING SYSTEM FOR MODULAR PANELS

Donald J. Sireci, 9 Oxford Dr., Deerfield, Ill. 60015

Continuation-in-part of Ser. No. 11,289, Feb. 5, 1987, Pat. No. 4,808,768. This application Dec. 2, 1988, Ser. No. 278,849

Int. Cl.[4] H02G *3/28*

U.S. Cl. 174—48 **11 Claims**



1. A utility routing system for interconnected modular wall panels having a base assembly consisting of a bottom plate and a top plate interconnected by struts where the bottom plate has a pair of spaced parallel linearly extending ribs, comprising: a baseline box adapted to receive at least one receptacle, projection means on the baseline boxes sized to slidably engage the bottom plate ribs so they define a track for the box, and means for clamping the baseline box to the bottom plate in any desired position.

4,899,019

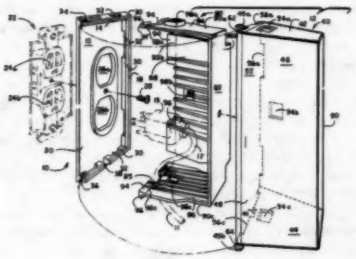
SAFETY COVER FOR ELECTRICAL RECEPTACLES

Robert G. Riceman, Roswell, Ga., assignor to Donald J. Scheer, Atlanta, Ga.

Filed Mar. 9, 1987, Ser. No. 23,685

Int. Cl.[4] H01R *13/447*

U.S. Cl. 174—67 **10 Claims**



1. A safety cover for an electrical receptacle comprising:

(a) a receiving plate capable of being affixed to an electrical receptacle for lockingly receiving a cover assembly;

(b) a cover assembly having at least one pair of opposite walls for covering said receptacle, said cover assembly comprised of an outer housing member and an inner housing member having a plurality of locking means extending outwardly beyond said outer housing member toward said receiving plate and located within and affixed to said outer housing member; and

(c) a plurality of individually operated locking means for locking said cover assembly to said receiving plate and unlocking said cover assembly from said receiving plate, said locking means positioned on said cover assembly in such a manner as to be incapable of simultaneous operation by a hand below a predetermined size and each said locking means comprised of:

(i) a depressable locking flange extending from said cover assembly;

(ii) a locking flange receiving means located on said receiving plate for receiving and holding said locking flange; and

(iii) means for depressing said locking flange into and out of locked position with said receiving means.

4,899,020

PRINTED WIRING UNIT FOR HORN SWITCH

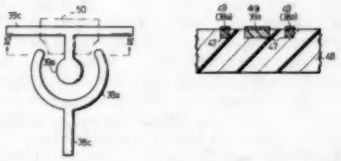
Satoshi Ohno, Inazawa, and Tetsushi Hiramitsu, Ichinomiya, both of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Aug. 25, 1988, Ser. No. 236,182

Claims priority, application Japan, Oct. 19, 1987, 62-159837[U]; Dec. 26, 1987, 62-330986

Int. Cl.[4] H05K *1/00*

U.S. Cl. 174—68.5 **4 Claims**



1. A printed wiring unit comprising:

an insulative base made of resin strong in corrosion resistance against an etching reqgent to be used in pre-treatment for plating,

a printed wiring pattern disposed on said insulative base

said base defining recesses for said wiring pattern disposed therein,

a pattern base being shaped substantially the same as said printed wiring pattern, molded so as to inlay within said recesses of said insulative base, and being made of resin weak in corrosion resistance against said etching reagent used in pre-treatment for plating, and

a conductive plating layer formed on said pattern base.

4,899,021

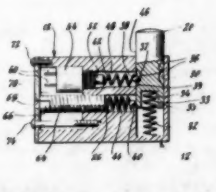
LATCHING SWITCH

Thomas M. Daniel, 167 N. Taylor Ave., Norwalk, Conn. 06854

Filed Apr. 22, 1988, Ser. No. 185,069

Int. Cl.[4] H01H *13/62*

U.S. Cl. 200—43.13 **12 Claims**



1. An improved latching switch, comprising:

(a) A portable switch body having an aperture formed therein and a first elongated cavity extending into said body from said aperture for receiving a switch actuating member therein;

(b) a switch actuating member positioned in said cavity and adapted for movement along a length of said cavity;

(c) a biasing means positioned in said cavity for causing said actuating member to extend through said aperture and from said body;

(d) a second elongated cavity formed in said body, said second cavity communicating with said first cavity and extending transversely thereto;

(e) a third elongated cavity formed in said body, said third cavity communicating with said first cavity and extending transversely thereto;

(f) a first latch means movably positioned in said second cavity for engaging and restraining said actuating member at a first location of said actuating member at which location said actuating member extends partly from said switch body;

(g) a second latch means movably positioned in said third cavity for engaging and restraining said actuating member at a second location of said actuating member at which location said actuating member is substantially recessed within said first cavity;

(h) an electrical switching means positioned in said switch body and responsive to movement of said first latch means in said second cavity for providing a first switching state when said switch actuating member is positioned at said first location and a second switching state when said switch actuating member is moved from said first location and is positioned at said second location; and,

(i) a key means for engaging and actuating said second latch means for releasing said latched actuating member from its second location whereby said biasing means causes said actuating member to advance to said first location in said first cavity at which it extends partly from said body.

4,899,022

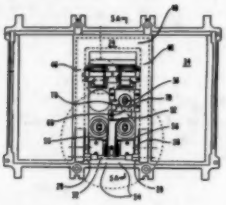
STORED ENERGY OPERATING MECHANISM CHARGING HANDLE AND COVER ASSEMBLY

David A. Leone; G. Lawrence Moody, both of Lawrenceville; William D. Holland, Stone Mountain; Mark E. Bell, Atlanta, and W. Dale Robbins, Snellville, all of Ga., assignors to Siemens Energy & Automation, Inc., Alpharetta, Ga.

Filed Oct. 11, 1988, Ser. No. 256,356

Int. Cl.[4] H01H *9/20, 5/00*

U.S. Cl. 200—50 A **6 Claims**



1. A circuit breaker comprising:

at least one pair of primary contacts;

means for storing energy, wherein the energy is used to close the primary contacts;

a circuit breaker case including a cover, wherein the contacts and means for storing energy are positioned within the case;

a handle pivotally mounted to the cover including means for transferring energy to the means for storing energy, wherein energy is transferred to the means for storing energy when the handle is pivoted from a first position;

means for initiating being activatable such that the closing of the primary contacts is initiated, the means for initiating being mounted to the cover; and

means for interlocking the means for initiating with the handle such that the means for initiating is restricted from being activated when the handle is pivoted from the first position.

4,899,023

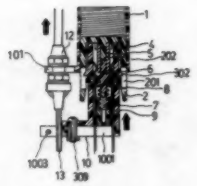
BICYCLE BRAKE LIGHT CONTROL SWITCH ASSEMBLY

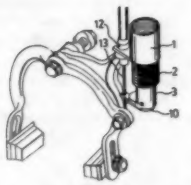
Lee Shu-Hwa, 7F, 16, Alley 3, Lane 227, Nung-An St., Taipei, Taiwan

Filed Feb. 14, 1989, Ser. No. 310,786

Int. Cl.[4] H01H *3/16*

U.S. Cl. 200—61.12 **7 Claims**





2. A bicycle brake light switch control assembly, said assembly comprising:

a housing;

means for securing said housing to a brake cable;

a socket housed in said housing, said socket having first elongated slots;

a sliding sleeve with a first inner hole therethrough, said sliding sleeve having locating holes and means for attaching said sliding sleeve to a brake cable;

conductive means;

insulating means;

a power jacket, said jacket having retainer noses engageable with said locating holes, said jacket also having notches;

conductive plate springs with a first end and a second end, said first ends disposed on said notches;

springing means disposed between said power jacket and said insulating means, so that when said springing means is in an equilibrium state, said second end of said conductive plate springs is contiguous to said insulating means and an electric circuit is not completed, but when the bicycle brake is activated, the brake cable urges said sliding sleeve to displace which in turn causes power jacket to push said second end of said conductive plate springs onto said conductive means and completing the electric circuit.

4,899,024

METHOD FOR TREATING LARGE CAST IRON DIES, PARTICULARLY FOR VEHICLE-SHEET METAL PRESSING

Luciano Puozzo, and Maurizio Manzin, both of Turin, Italy, assignors to 501 Fiat Auto S.P.A., Turin, Italy

Filed Dec. 21, 1987, Ser. No. 135,306

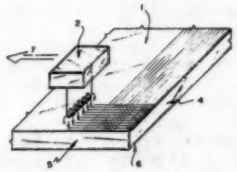
Claims priority, application Italy, Dec. 19, 1986, 67946 A/86

Int. Cl.[4] H05B *6/64*

U.S. Cl. 219—10.41 **4 Claims**

1. A method for localized induction hardening of adjacent regions of a cast iron piece, in particular the piece forming at least a part of a die for pressing metal sheets, to produce, in each said region, a localized martensitic transformation, said

adjacent regions having a portion in common, wherein the hardening of said common portion is obtained by two successive hardening operations performed along directions at sub-



stantially right angles to each other and in such a manner as to obtain in said adjacent regions a depth of the martensitic transformation of 1 to 3 mm and a surface hardness exceeding 400 HB.

4,899,025

HEATING APPARATUS COMPRISING AT LEAST TWO INDEPENDENT INDUCTORS

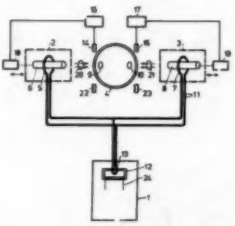
Ronald P. T. Kamp, and Johannes P. De Meij, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 1, 1988, Ser. No. 278,706

Claims priority, application Netherlands, Dec. 16, 1987, 8703043

Int. Cl.[4] H05B *6/08*

U.S. Cl. 219—10.57 **7 Claims**



1. A heating apparatus comprising: a high-frequency generator, at least two heating inductors connected to the high-frequency generator for inductively heating workpieces in which each inductor includes an induction coil coupled to the high-frequency generator and a high-permeability coil core, means for displacing said coil cores within respective induction coils mutually independently, and at least one detector for detecting at least one process parameter in the induction heating process, said process parameter being determined exclusively by the workpiece, and wherein the displacing means independently displace the coil cores in response to detection signals received from the at least one detector in order to individually switch the transfer of energy on and off between said high-frequency generator and said workpieces.

4,899,026

AUTOMATIC COOKING CONTROL SYSTEM FOR A MICROWAVE OVEN

Ki Tae Oh, Kyungsangnam, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Dec. 21, 1988, Ser. No. 287,020

Claims priority, application Rep. of Korea, Dec. 22, 1987, 14744/1987

Int. Cl.[4] H05B *6/68*

U.S. Cl. 219—10.55 M **16 Claims**

1. A method of automatically cooking food in a microwave oven having a heating chamber and a magnetron, comprising the steps of:

(a) measuring an initial temperature of air flowing into the heating chamber;

(b) storing the initial temperature as a first reference value and a first temperature;

(c) delaying eight seconds;

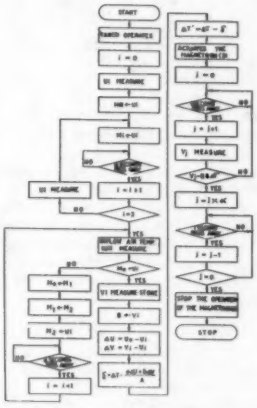
(d) measuring and storing a temperature of the air flowing into the heating chamber;

(e) repeating said steps (c) and (d) until a second and third temperature is measured and stored;

(f) measuring a fourth temperature of the air flowing into the heating chamber;

(g) determining if the fourth temperature is equal to the first temperature;

(h) measuring and storing a temperature of air flowing out of



the heating chamber as a second reference value when said step (g) has determined that the fourth temperature is equal to the first temperature;

(i) calculating a temperature increment value by using the first reference value, fourth temperature, and the temperature of the air flowing out of the heating chamber;

(j) actuating the magnetron for a first time period;

(k) measuring the temperature of the air flowing out of the heating chamber;

(l) determining if a difference between the temperature measured in said step (k) and the second reference value is greater than or equal to the temperature increment value; and

(m) actuating the magnetron for a second time period when said step (l) has determined that the difference is greater than or equal to the temperature increment value, thereby automatically cooking food.

4,899,027

DOUBLE-EFFECT TABLE WITH HEATING AND COOLING PURPOSES

Jackson Wong, No. 14, Li-Chih New Village, Tso-Ying District, Kaohsiung City, Taiwan

Filed May 22, 1989, Ser. No. 355,340

Int. Cl.[4] H05B *6/12*

U.S. Cl. 219—10.493 **1 Claim**

1. A double-effect table comprising:

an upper table plate having an electromagnetic oven capable of producing electromagnetic waves for heating or cooking purpose embedded in the upper table plate, coplanar to an upper surface of said upper table plate;

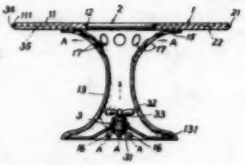
a hollow foot stand positioned under said upper table plate having an upper portion of said foot stand enlarged up-

wardly for connecting and supporting said upper table plate and having a lower portion of said foot stand enlarged downwardly for standing said foot stand and said table on a floor; and

a cooling fan provided in said foot stand operatively driven for discharging air radially outwardly from said foot stand,

the improvement which comprises:

said hollow foot stand having said lower portion formed with a plurality of air inlet holes, and having said upper portion of said stand formed with a plurality of air



discharge holes radially disposed and transversely formed through said upper portion of said hollow foot stand,

said driving motor and said cooling fan mounted in said lower portion of said foot stand,

whereby upon a running of the driving motor and cooling fan, a cooling air is sucked from the lower portion of said foot stand, and directed through said hollow foot stand to be discharged from the upper portion of said foot stand for evenly cooling people sitting around said table.

4,899,028

SUCTION AND EXHAUST SYSTEM OF A HEAT COOKING APPARATUS

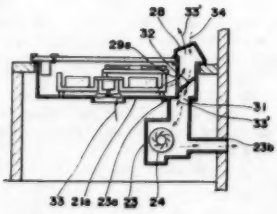
Akihiko Arai; Kazuichi Okada, both of Hirakata; Tetsuo Kamo, Yawata, and Eiji Shiota, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 129,739, Dec. 7, 1987, abandoned. This application Feb. 24, 1989, Ser. No. 315,220

Claims priority, application Japan, Dec. 11, 1986, 61-295254

Int. Cl.[4] H05B *6/12*; E24C *15/10*

U.S. Cl. 219—10.493 **2 Claims**



1. A suction and exhaust system of a heat cooking apparatus comprising:

a main casing defining a compartment adapted to house heating components of the cooking apparatus, and a ventilation hole open to said compartment;

a cooling device disposed in an air cooling relationship with said compartment for introducing cooling air into said compartment;

an exhaust device defining an exhaust intake open to the exterior of the system and an exhaust passage extending from said exhaust intake, and

said exhaust device comprising a fan disposed in an air suction relationship with said exhaust passage for generating suction to draw vapors generated by an object to be heated by the apparatus through said exhaust intake and into said exhaust passage,

said exhaust passage open to said ventilation hole, and said exhaust device disposed in an air suction relationship with said compartment through said ventilation hole in which the suction generated by said fan also draws the cooling air introduced into said compartment by said cooling device through said ventilation hole and into said exhaust passage; and

a switch operatively connected to said fan for turning said fan on and off independently of the operation of said cooling device.

4,899,029

ELECTRICAL CONNECTOR HIGH-SPEED WELDING APPARATUS

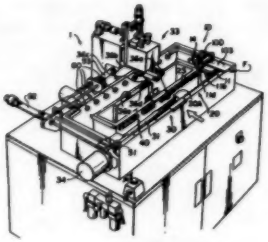
Naoki Kumagai, Machida, Japan, assignor to AMP Incorporated, Harrisburg, Pa.

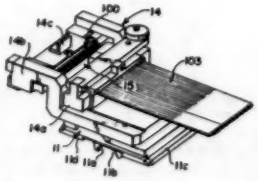
Filed Oct. 25, 1988, Ser. No. 262,389

Claims priority, application Japan, Nov. 12, 1987, 62-286438

Int. Cl.[4] B23K *11/16*, *9/12*

U.S. Cl. 219—56.1 **6 Claims**





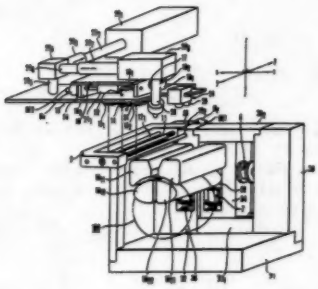
1. A high-speed welding apparatus for welding electrical conductors of an electrical cable (103) to electrical contacts of an electrical connector (100) comprising a holder (14) for holding the connector and cable, a carrier member (11) onto which the holder (14) is mounted, a frame (F) for supporting the carrier member (11) and along which the carrier member moves, a welding device (33) for welding the conductors to the contacts as the connector and cable move relative thereto along a welding station (30), characterized in that a first conveying mechanism (20) on said frame (F) moves the carrier member (11) to the welding station (30); a feed mechanism (30A) on said frame (F) engaging said carrier member (11) to continuously feed the carrier member with the connector (100) and cable (103) thereon along the welding station while the welding device (33) automatically welds the conductors of the cable (103) to the contacts of the connector (100); and a second conveying mechanism (40) mounted on the frame (F) for moving the carrier member away from the welding station after the cable conductors have been welded to the connector contacts.

4,899,030

HIGH-POWER-DENSITY BEAM WELDING METHOD IN COMBINATION WITH UPSET WELDING AND APPARATUS THEREFOR

Yasunobu Miyazaki; Tohru Saito, and Taizo Nakamura, all of Kanagawa, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Sep. 6, 1988, Ser. No. 240,612
Claims priority, application Japan, Sep. 4, 1987, 62-221562; Aug. 8, 1988, 63-197697
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121.63 14 Claims



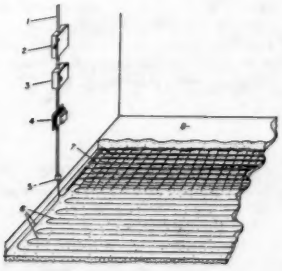
1. A method of welding, comprising the steps of:
(i) placing two substantially planar surfaces of a workpiece or workpieces in spaced facing relation, said planar surfaces defining edges of said workpiece or workpieces;
(ii) heating said workpiece or workpieces near said edges to a welding temperature and pressing said surfaces together to thereby form a substantially continuous upset weld line; and
(iii) irradiating said upset weld line formed in step (ii) with a high power density beam to thereby form a substantially continuous final weld line.

4,899,031

PULSED ELECTRICAL HEATING OF CONCRETE

David F. Dyer, P.O. Box 2255, Auburn, Ala. 36831, assignor to David F. Dyer, Auburn, Ala.

Filed Nov. 14, 1988, Ser. No. 271,120
Int. Cl.[4] H05B *1/00*
U.S. Cl. 219—213 3 Claims



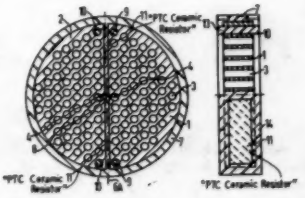
1. A method of supplying a pulsed flow of electric heat within green concrete for curing purposes, comprising the steps of
a. having a designed form for molding concrete,
b. positioning at selected locations within said form a medium for conducting electric heat within the form,
c. having means for wiring the medium to an electric timer equipped to control the flow of electric current passing through said timer to multiple selections of pulsed on and off cycles and having means for furnishing electric current to said timer,
d. placing soft green concrete in the form and surrounding the medium with said concrete to allow the electric timer to deliver selected on and off pulsed heat within said concrete.

4,899,032

ELECTRIC HEATING ELEMENT UTILIZING CERAMIC PTC RESISTORS FOR HEATING FLOORING MEDIA

Helmut Schwarzl, Leutschach, and Josef Unterlass, Graz, both of Austria, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 9, 1988, Ser. No. 166,011
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1987, 3708056; Mar. 12, 1987, 8703749
Int. Cl.[4] H05B *1/02, 3/14, 3/20*; H01C *7/02*
U.S. Cl. 219—375 17 Claims



1. A heating element for heating a flowing medium comprising:
a plurality of metallic bodies arranged in side-by-side juxtaposed relationship and means for mechanically fixing the bodies together along juxtaposed boundary surfaces thereof to form a substantially cylindrically shaped heat exchanger,
said metallic bodies having a plurality of regularly arranged passageways for the medium to flow through the bodies, said passageways being tapered in a conical fashion at inlets thereof in the direction of the flow of the medium,
said means for fixing including at least one bridge formed of an electrically insulating synthetic resin material having a thermal expansion coefficient equal to that of the metallic bodies, which extends across said juxtaposed boundary surfaces of adjacent metallic bodies and through a passageway located in each body adjacent the boundary surface thereof,
said metallic bodies having a volume excluding the volume of the passageways being at least equal to the volume of the passageways,
said metallic bodies being made of a good heat conducting metal;
at least one disc-like positive temperature coefficient ceramic PTC resistor located between the juxtaposed boundary surfaces of two adjacent metallic bodies;
said at least one ceramic PTC resistor having large surfaces with a covering mechanically attached and electrically coupled to the boundary surface of the respective adjacent metallic body by an electrically and thermally conductive adhesive, any cavity remaining between the boundary surfaces and around said at least one ceramic PTC resistor being filled to encase said ceramic PTC resistor in a casing of the electrically insulating synthetic resin material, said casing insulating said at least one ceramic PTC resistor from external influences, said synthetic resin material having virtually

the same thermal expansion coefficient as the metallic bodies; and

said metallic bodies having means for forming a connection to a current supply to provide current to said at least one ceramic PTC resistor.

4,899,033

ELECTRIC HOTPLATE CONNECTING PIECE

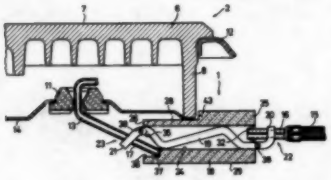
Robert Kicherer; Felix Schreder, and Stefan Reif, all of Oberderdingen, Fed. Rep. of Germany, assignors to E.G.O. Elektro-Geraete Blanc u. Fischer, Fed. Rep. of Germany

Filed Aug. 25, 1988, Ser. No. 236,768

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1987, 3728528

Int. Cl.[4] H05B 3/70

U.S. Cl. 219—451 **27 Claims**



14. An electric hotplate connecting piece for electrically connecting at least one connecting member of a hotplate to supply lines, comprising:

an insulator body for receiving at least one electrical lead provided for connecting at least one connecting member of a hotplate to at least one supply line by means of at least one electric connection point, said at least one connection point having a projecting connecting part of said lead provided to be connected to a freely projecting, associated incoming connecting part, wherein said lead has a length extension between ends and connecting parts, said lead being located substantially in a single median longitudinal plane over substantially said entire length extension, said lead being curved and bent several times in opposite directions between said ends and said connecting parts, at the most one of said ends being located transverse to said median longitudinal plane.

4,899,034

METHOD OF OPERATING A CONTROL UNIT

Brian J. Kadwell, Holland; Daniel L. Fowler, Kentwood, and Gregory F. Gawron, Holland, all of Mich., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 939,872, Dec. 10, 1986, Pat. No. 4,782,215.

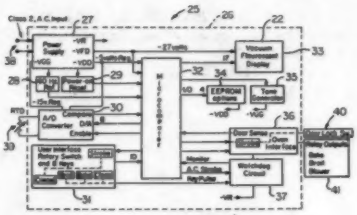
This application Oct. 18, 1988, Ser. No. 259,189

The portion of the term of this patent subsequent to Nov. 1, 2005, has been disclaimed.

Int. Cl.[4] H05B 1/02

U.S. Cl. 219—494 **18 Claims**

1. In a method of operating a temperature regulating control unit comprising a RTD temperature sensor means and a microcomputer for receiving digital signals from said sensor means in relation to the temperature being sensed by said sensor means, the improvement comprising the step of applying a varying voltage to said sensor means and comparing the resultant current level through said sensor means at certain values of aid voltage applied thereto with a fixed reference current level that has been predetermined as being the current level that would exist through said sensor means when that particular certain voltage is being applied to said sensor means while said sensor means would be sensing a particular certain temperature within a predetermined temperature range, the step of applying said varying voltage to said sensor means applying said varying voltage in an increasing manner from a starting low voltage toward a higher stopping voltage until a particular certain voltage between said starting voltage and said stopping voltage is applied to said sensor means that creates a current level through said sensor means that substantially equals said fixed reference current level whereby said microcomputer will receive said digital signal means in a manner to determine the actual temperature being sensed by said sensor means at that time and when said actual temperature is within said temperature range.



4,899,035

SCANNING DEVICE FOR A CHIP CARD

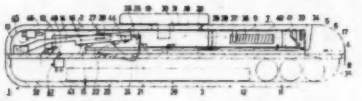
Peter Goldmann; Gerhard Habelt, both of Vienna, and Hans Weihs, Purkersdorf, all of Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 25, 1988, Ser. No. 262,914

Claims priority, application Austria, Oct. 27, 1987, 2821/87

Int. Cl.[4] G06K 7/06

U.S. Cl. 235—441 **9 Claims**



1. A scanning device for a chip card having a lever arm, which is pivotably journalled, carries a set of contacts and can be pivoted towards a chip card inserted into the scanning device and then occupying an operating position, the set of contacts contacting contacts provided on the chip card, characterized in that the lever arm is pivoted towards the operating position of a chip card by a slide slidably guided parallel to the direction of insertion of a chip card into the scanning device, which slide is in turn displaceable by an individual operating member that can be operated by hand.

4,899,036

TRANSACTION SYSTEM

John A. McCrindle; Antony F. Steiner, and Andrew M. Jackson, all of Chelmsford, England, assignors to The General Electric Company, p.l.c., London, England

Division of Ser. No. 849,296, Apr. 8, 1986, Pat. No. 4,845,347.

This application May 22, 1989, Ser. No. 342,863

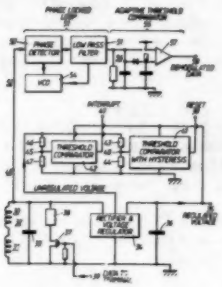
Claims priority, application United Kingdom, Apr. 10, 1985, 8509135

Int. Cl.[4] G06K 5/00

U.S. Cl. 235—380 **33 Claims**

1. A transaction system including a terminal; a token having an on-board data processing capability; means for inductively coupling the token with the terminal to permit data communication therebetween; means for transmitting data from the

terminal to the token via a modulated carrier signal; and means for transmitting data from the token to the terminal by modulation of the level of the carrier signal at the terminal by the token as it draws power from the terminal.



4,899,037

MAGNETIC INFORMATION-RECORDING ELEMENT AND METHOD OF MANUFACTURE

Claude Marechal, and Christian Schmuckle, both of Paris, France, assignors to Eastman Kodak Company, Rochester, N.Y.

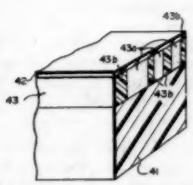
PCT No. PCT/EP87/00224, § 371 Date Jan. 19, 1988, § 102(e) Date Jan. 19, 1988, PCT Pub. No. WO87/06745, PCT Pub. Date Nov. 5, 1987

PCT Filed Apr. 23, 1987, Ser. No. 150,419

Claims priority, application France, Apr. 28, 1986, 8606238

Int. Cl.[4] G06K *19/06*

U.S. Cl. 235—493 **12 Claims**



1. A magnetic information recording element comprising a support having thereon a coated layer of at least one magnetic information recording track in contact and adjacent to at least one non-magnetic track, the magnetic tracks comprising dispersed magnetic particles and the non-magnetic tracks comprising dispersed non-magnetic particles.

4,899,038

IDENTIFICATION CARD

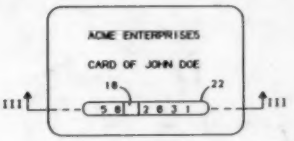
Alfred R. Rearigh, 550 Finnin Rd., New Kensington, Pa. 15068

Filed Dec. 2, 1987, Ser. No. 127,687

Int. Cl.[4] G06K *19/06*

U.S. Cl. 235—493 **4 Claims**

1. An identification system comprising a card bearing a code, in combination with a means operable by a holder of the card for hiding a selected portion of the code for creating a subcode associated with the proper holder, said means comprising a slide movable along a track on the card, the track bearing the code.



4,899,039

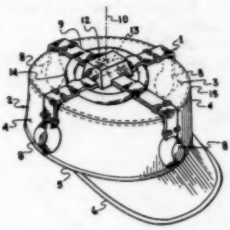
PHOTODETECTOR ARRAY FOR SOFT HAT MOUNTING USING A LOOP ANTENNA

Leo O. Taylor, and Fritz W. Healey, both of Alta Loma, Calif., assignors to Loral Electro-Optical Systems Inc., Pasadena, Calif.

Filed Feb. 11, 1988, Ser. No. 155,107

Int. Cl.[4] F41G *3/26*

U.S. Cl. 250—209 **5 Claims**



1. A soft hat photodetector array including:

a plurality of signal generating photodetectors;

a radio transmitter assembly including a source of power;

a loop antenna electrically coupled to the transmitter;

wiring connecting the photodetectors and antenna to the transmitter whereby signals generated by the photodetectors are received for transmission by the transmitter assembly through the antenna; and

means for flexibly mounting said photodetectors, assembly, antenna and wiring to a soft hat.

4,899,040

LIGHT-CONDITIONING APPARATUS FOR AN IMAGE SCANNER ILLUMINATION SYSTEM

Michael H. Davis, Marion, and Gary L. Erck, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 8, 1988, Ser. No. 241,685

Int. Cl.[4] H01J *3/14;* **G03B** *27/00*

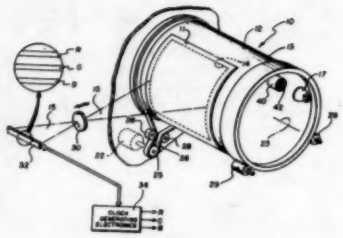
U.S. Cl. 250—216 **5 Claims**

1. In image scanner apparatus including a linear image scanner, and lens apparatus having a given field of view to focus a line of light in an object plane onto said linear image sensor, the improvement comprising:

(a) a source of light having an irradiance profile; and

(b) light-conditioning illuminator apparatus interposed between said light source and said object plane having (1) an input arranged adjacent said light source to receive substantially all of the light radiating from said light source, and (2) an output, facing said object plane, distributed to radiate the light received in a line-like pattern in said object plane wherein the amount of radiant power along

the line varies progressively as a function of the reciprocal of the anticipated irradiance along said image sensor arising when said lens apparatus focuses a line of light of uniform power.



4,899,041

LIGHT SENSOR FOR DETECTING AN OBJECT IN A CERTAIN DISTANCE

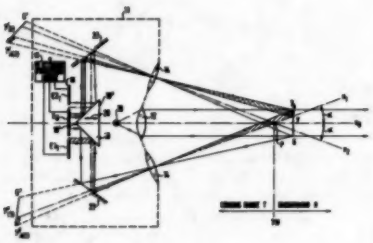
Günter Fetzer, Gundelfingen, and Thomas Meinert, Emmendingen, both of Fed. Rep. of Germany, assignors to Erwin Sick GmbH Optik-Elektronik, Waldkirch, Fed. Rep. of Germany

Filed Sep. 2, 1988, Ser. No. 239,732

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1987, 3729334

Int. Cl.[4] G01C *3/08*

U.S. Cl. 250—222.1 11 Claims



1. Light sensor comprising a light transmitter having a light source and an optical transmitting system which radiates light along an axis of the transmitting system; and two light receiving systems arranged on opposite sides of the light transmitter; wherein each light receiving system has an objective lens which picks up light scattered back from an object to be detected along an axis of the receiving system which lies symmetric to the axis of the transmitter system, the receiving system axes and the transmitter system axis lying in the same plane; wherein the receiving systems each contain two light sensitive element detection zones of which one picks up light essentially from a sensing region and the other picks up light essentially from a background region of the field of view of the light sensor; and wherein an output signal used to recognize the article is obtained by additive superposition of signals from the detection zones associated with the sensing region and of the signals from the detection zones associated with the background region and by difference formation of the two summed signals, characterized in that a light sensitive element is provided with three photoelectric detection zones ($E1_T$, E_H, $E2_T$) with a central detection zone (E_H) being associated with the background region (H); in that received light picked up by the two objective lenses (14) is transferred to the central detection zone for additive signal superposition by means of two fixedly arranged deflecting mirrors (22) and a roof edge mirror (18) located between them; in that the roof edge mirror (18) is adjustable along the axis (x_O) of the transmitting system for the purpose of adjusting the angle between the axes of the receiving system (x_1, x_2) which are determined by central rays which pass through the centers of the respected objective lenses (14) and along respective imaginary lines disposed between and separating the three detection zones ($E1_T$, E_H, $E2_T$).

4,899,042

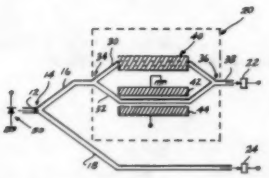
INTEGRATED OPTIC FIELD SENSOR CONSISTING OF AN INTERFEROMETER FORMED IN SUBSTRATE

Robert A. Falk, Renton, and Raymond W. Huggins, Mercer Island, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Nov. 17, 1987, Ser. No. 121,466

Int. Cl.[4] H01J *40/14*; G01D *5/34*

U.S. Cl. 250—227 14 Claims



1. An integrated optic electric field sensor for measuring the strength of an electric field, the sensor comprising:

an interferometer formed in a substrate, the interferometer comprising first and second arms, each arm having first and second ends and comprising an optical waveguide formed in the substrate, the interferometer further comprising field sensitive means having a physical property and positioned adjacent the first arm, the field sensitive means including means for varying the physical property in accordance with the strength of the electric field, and for thereby changing the optical path length of the first arm in accordance with the strength of the electric field;

means for coupling radiation into the first ends of the first and second arms; and

means for combining radiation from the second ends of the first and second arms to produce an optical output signal having an amplitude that varies in strength with the strength of the electric field.

4,899,043

FAULT MONITORING SYSTEM FOR OPTICAL FIBER COMMUNICATION SYSTEMS

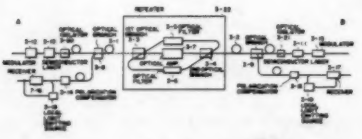
Kiyofumi Mochizuki, Hachioji; Noboru Edagawa, Tokyo, and Yoshinao Iwamoto, Wakayama, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 15, 1988, Ser. No. 219,601

Claims priority, application Japan, Jul. 23, 1987, 62-182243

Int. Cl.[4] H01J *5/16*

U.S. Cl. 250—227 2 Claims



1. A fault monitoring system for an optical fiber transmission system having a bidirectional optical amplifier between first and second optical fiber transmission lines:

wherein first and second optical branches are provided in

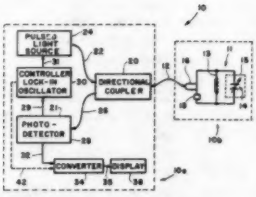
first and second input/output ports of the bidirectional optical amplifier at the sides of the first and second optical fiber transmission lines, respctively; a first optical filter which permits the passage therethrough of an optical monitoring signal of a first frequency transmitted from a first station is provided in a first optical branch path which is branched by the first optical branch, coupled to the second optical branch and connected to the second input-/output port of the bidirectional optical amplifier; a second optical filter which permits the passage therethrough of a optical monitoring signal of a second frequency which is transmitted from a second station and not permitted to pass through the first optical filter is provided in a second optical branch path which is branched by the second optical branch, coupled to the first optical branch and connected to the input/output port of the bidirectional optical amplifier; and monitor means provided at each of the first station and the second station to monitor for the location of a fault monitor signals of the first and second frequencies which are sent back to the first and second optical fiber transmission lines, respectively.

4,899,044

OPTICALLY COUPLED REMOTE SENSOR APPARATUS AND SYSTEM

J. Richard Hansen, Wilkins, Twp., Allegheny County; Juris A. Asars, and Robert M. Oates, both of Murrysville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 29, 1988, Ser. No. 188,245
Int. Cl.[4] G01D *5/34*
U.S. Cl. 250—227 **12 Claims**



1. A sensor apparatus comprising:

a sensor having an electrical parameter which varies in value in accordance with a condition being sensed;

a tuned circuit incorporating the electrical parameter of the sensor and generating an oscillatory voltage of a predetermined amplitude and at a natural resonant frequency and corresponding period which is a function of and varies in accordance with variations in the electrical parameter value of the sensor;

a light emitting diode connected in parallel with the tuned circuit and being operable in both a photovoltaic mode and a light emitting mode; and

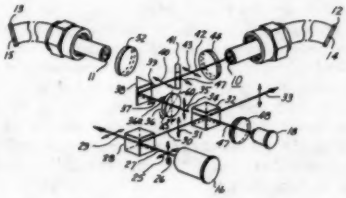
means for biasing the light emitting diode in a back-biased and non-conducting state during a majority of the period of the oscillatory voltage of the tuned circuit, the light emitting diode, when back-biased and exposed to light, generating a photovoltaic current for ringing the tuned circuit and, when forward-biased by the oscillatory voltage, emitting a corresponding sensor-output light pulse.

4,899,045

MULTIPLE CHANNEL FIBER OPTIC CONTINUITY TEST SYSTEM

David M. Kramer, Rancho Palos Verdes, Calif., assignor to Hi-Shear Corporation, Torrance, Calif.

Filed May 24, 1988, Ser. No. 197,931
Int. Cl.[4] G01N *21/88*
U.S. Cl. 250—227 **4 Claims**



1. An optical system for individually testing each one of a plurality of optical fibers for continuity, each said fiber having a proximal end and a distal end with a dichroic reflector at each distal end reflective of wavelengths respective to a source of testing light and transmissive to other wavelengths, said system comprising:

a source of testing light;

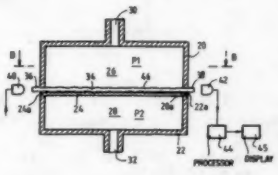
a first polarizing element adapted to reflect impinging light of a selected polarization along a segment, and to pass all other light out of the system, a non-polarizing first beam splitter with one axis normal to that of a source of said testing light and one axis coincident therewith, a polarizing second beam splitter having the property of transmitting only light polarized in one plane and reflecting only light polarized in a plane that forms a 90 degree dihedral angle therewith, and a polarization rotator half-wave plate in the optical path between the first beam splitter and the second beam splitter, said rotator being insertable into and removable from the optical path to determine which plane of polarization will represent light to be presented from said second polarizing beam splitter to a selected one of said fibers.

4,899,046

OPTICAL SENSOR OF PHYSICAL MAGNITUDE

Oliver Wright, Paris, and Sylvain Janssen, Neuilly-sur-Seine, both of France, assignors to Schlumberger Industries, S.A., Montrouge, France

Continuation of Ser. No. 944,121, Dec. 22, 1986, abandoned. This application Feb. 9, 1989, Ser. No. 309,958
Claims priority, application France, Dec. 24, 1985, 85 19111; Aug. 14, 1986, 86 11767
Int. Cl.[4] G01L *1/24, 13/00*
U.S. Cl. 250—227 **19 Claims**



1. An optical sensor of a physical magnitude comprising:

a light guide having a first and a second end between which said light guide is substantially straight, said light guide comprising a single uniform medium for conveying light from said first end to said second end, said medium being

bounded by a wall extending between both of said ends, at least one portion of said wall having a light absorptivity greater than that of said medium;

a light source at said first end for applying a light beam to said first end of said light guide;

means at said second end and optically arranged facing said second end of said light guide for receiving a least a part of the light beam transmitted through said light guide and for generating a signal therefrom;

deformable support means extending at all points between said first and second ends for supporting said light guide;

means for applying to substantially the entire support means a bending deformation which is representative of a value of said physical magnitude, the amount of light transmitted through said light guide being affected by contact with said at least one portion of said wall having a light absorptivity greater than that of said single medium as a result of said bending deformation of said light guide; and

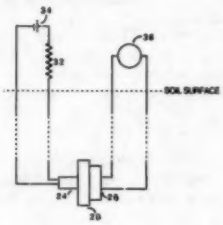
means for processing the received signal in order to derive therefrom a characteristic feature of the deformation of the support means.

4,899,047

METHOD AND APPARATUS FOR SELECTIVELY DETECTING ONE OF TWO IMMISCIBLE LIQUIDS IN THE PRESENCE OF THE OTHER LIQUID

John W. Cry; Randy R. Kirkham; John F. McBride; Carver S. Simmons, and Glendon W. Gee, all of Richland, Wash., assignors to Battelle Memorial Institute, Richland, Wash.

Filed Jun. 24, 1988, Ser. No. 210,874
Int. Cl.[4] H01J *5/16*
U.S. Cl. 250—227 **16 Claims**



1. Apparatus for detecting a first of two immiscible liquids in the presence of the second liquid, comprising a translucent, porous, dimensionally stable body that absorbs the first liquid in preference to the second liquid, and means for detecting the amount by which light incident on the body is attenuated on propagation through the body.

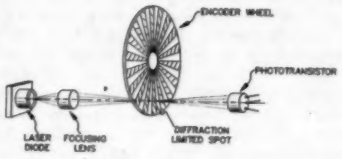
4,899,048

FOCUSED OPTICAL BEAM ENCODER OF POSITION

David J. Shelander, St. Paul, Minn., assignor to Printware, Inc., Saint Paul, Minn.

Filed Apr. 27, 1987, Ser. No. 43,167
Int. Cl.[4] G01D *5/34*; H01J *3/14*
U.S. Cl. 250—231 SE **25 Claims**

1. In an optical position encoder having a source of light, a detector of light from the source of light, and a grating which moves relative to a path of light between the source and the detector in order to, by such movement, selectively interrupt the light path between source and detector so that the motion of the grating may be detected by these interruptions, an improvement comprising:



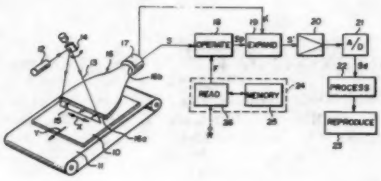
a focusing means between the source of light and the grating for convergently focusing the light from the source of light onto the grating.

4,899,049

RADIATION IMAGE READ-OUT APPARATUS

Kazuhiro Hishinuma, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 17, 1986, Ser. No. 920,219
Claims priority, application Japan, Oct. 18, 1985, 60-232509
Int. Cl.[4] G03C *5/16*
U.S. Cl. 250—327.2 **4 Claims**



1. A radiation image read-out apparatus comprising:

(i) a stimulating ray emission means for emitting stimulating rays to a stimulable phosphor sheet carrying a radiation image of an object stored thereon by exposure to a radiation passing through said object,

(ii) a photodetector for photoelectrically detecting light emitted by said stimulable phosphor sheet in proportion to the stored radiation energy when said stimulable phosphor sheet is exposed to said stimulating rays,

(iii) an amplifier for amplifying a read-out image signal generated by said photodetector,

(iv) an A/D converter for digitizing an output of said amplifier,

(v) a scattered radiation amount predictor for predicting a scattered radiation amount stored on said stimulable phosphor sheet,

(vi) an operation circuit positioned between said amplifier and said photodetector for subtracting a signal component representing said scattered radiation amount from said read-out image signal on the basis of said scattered radiation amount predicted by said scattered radiation amount predictor, and

(vii) an expander positioned between said operation circuit and said amplifier for adjusting an image signal generated by said operation circuit to a predetermined level.

4,899,050

CEILING FAN CONTROL WAND

Robert A. Cianflone, 885 Lovingston Dr., Pittsburgh, Pa. 15216

Filed Jan. 11, 1989, Ser. No. 295,504
Int. Cl.[4] H01H *3/20*
U.S. Cl. 200—331 **6 Claims**

1. A control wand for use in connection with a ceiling fan of

the type having a pull chain and having a slide switch button thereon, the control wand comprising a first elongated rod-shaped body having a handle formed at a first end and a hook portion formed at a second end, a second elongated rod-shaped body slidably positioned adjacent said first body and having a hook portion formed at a first end and a right angle bent portion formed at a second end, said bent portion also having a hook-shaped element formed at an end region and adapted to engage the pull chain when in use, said control wand further comprising a first tubular bushing surrounding said first and

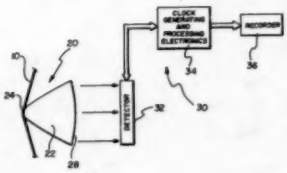
second elongated rod-shaped bodies and secured to the hook portion at the second end of the first rod-shaped body to permit sliding movement of said second rod-shaped body therethrough and a second tubular bushing surrounding said first and second elongated rod-shaped bodies and secured to the hook portion at the first end of the second elongated body to permit sliding movement of the first elongated body therethrough, whereby, in use, said first and second elongated rod-shaped bodies are extensible and contractable to vary the reach of said control wand.

4,899,051

METHOD AND DEVICE FOR SIMULATING THERMAL EFFECTS AT THE INTERFACE OF A MAGNETIC HEAD AND A RECORDING MEDIUM

Michael J. Helm, Schenectady, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 19, 1988, Ser. No. 286,191
Int. Cl.[4] G01N *3/56, 21/84*
U.S. Cl. 250—340 **5 Claims**



5. A method for simulating wear of a magnetic transducer head comprising:

(a) simulating an actual magnetic transducer head with an infrared transmitting material having a wear-resistant property approximating that of the actual magnetic head and configured to have (1) a working surface geometrically closely approximating the dimensions and contour of a working surface of the actual head, and (2) an opposing surface geometrically closely approximating the dimensions and contour of a light-transmitting surface of a positive spherical lens;

(b) moving a magnetic storage medium in transducing relationship over the working surface of the infrared transmitting material; and

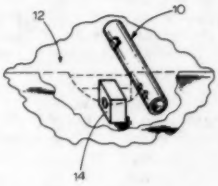
(c) transmitting infrared radiation emitted at the interface between said working surface and the magnetic storage medium through the opposing surface of the material onto a detector.

4,899,052

INFRARED DIAGNOSTIC INSTRUMENT

Donald F. Lindquist, Sweetwater, Tenn., assignor to Eastern Gate, Inc., Jeffersonville, Ind.

Filed Aug. 24, 1988, Ser. No. 236,048
Int. Cl.[4] G01J *1/44*
U.S. Cl. 250—342 **15 Claims**



1. A diagnostic instrument for the detection of infrared radiation in the repair of electronic equipment containing an infrared radiation emitter, said instrument comprising:

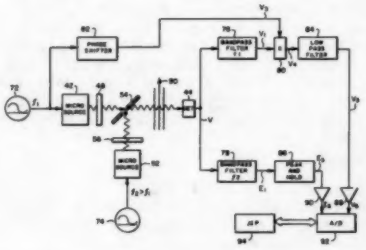
a housing dimensioned for being received within said equipment; and an electronic circuit received within said housing, said circuit comprising means for testing the functioning of an infrared emitter while said emitter is contained within said equipment, said means for testing being operable to detect the presence of infrared radiation emitted from said infrared radiation emitter, wherein the amount of disassembly of said equipment required to effect said testing is minimized.

4,899,053

SOLID STATE NON-DISPERSIVE IR ANALYZER USING ELECTRICAL CURRENT-MODULATED MICROSOURCES

N. C. Joseph Lai, Brookfield; Edward J. Zuperku, Elm Grove, and Roy A. Henning, Milwaukee, all of Wis., assignors to Criticare Systems, Inc., Waukesha, Wis.

Filed Oct. 21, 1987, Ser. No. 111,621
Int. Cl.[4] G01N *21/31, 21/35*
U.S. Cl. 250—343 **23 Claims**



12. An optical system for measuring levels of a selected gas, comprising:

a sample chamber which defines a measuring axis;

a first optical source operative to generate a measuring beam directed along the measuring axis through the sample chamber, said measuring beam comprising radiation at a wavelength corresponding to a selected absorption peak of the selected gas;

a detector responsive to the measuring beam after it has

passed through the sample cell to produce a detector signal;

means for supplying a time modulated current to the first optical source such that the measuring beam is substantially sinusoidal at frequency f_1;

means for combining an f_1 frequency component of the detector signal with an additional signal matched in frequency to the f_1 frequency component of the detector signal to form a resulting signal having a periodic component at $2 \cdot f_1$ and a low frequency component, wherein the low frequency component varies in amplitude in accordance with the amplitude of the f_1 frequency component of the detector signal; and

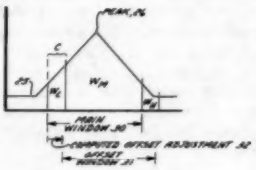
means for measuring the amplitude of the low frequency component of the resulting signal to determine the amplitude of the f_1 frequency component of the detector signal.

4,899,054

GAMMA CAMERA WITH IMAGE UNIFORMITY BY ENERGY CORRECTION OFFSETS

Jesper M. Barfod, Molle, Denmark, assignor to General Electric Company, Milwaukee, Wis.

Filed Jan. 19, 1988, Ser. No. 144,900
Int. Cl.[4] G01T *1/161*
U.S. Cl. 250—369 **14 Claims**



1. A method for validating detected events in a gamma camera comprising the steps of:

forming an energy signal corresponding to the energy of a detected event;

determining the location of said event and whether said location has a sensitivity greater than a predetermined sensitivity, said location having a corresponding energy range and comprising a first location type if the sensitivity of said location is greater than said predetermined sensitivity and otherwise comprising a second location type;

validating said detected event if said determined location is of a first location type and said energy signal falls within said corresponding range of energies as said range of energies is displaced in a manner to reduce said sensitivity to substantially said predetermined sensitivity; and

validating said detected event if said determined location is of a second location type and said energy falls within said corresponding energy range without displacement of said range.

4,899,055

THIN FILM THICKNESS MEASURING METHOD

Arnold Adams, Goleta, Calif., assignor to Tencor Instruments, Mountain View, Calif.

Filed May 12, 1988, Ser. No. 193,902
Int. Cl.[4] G01N *21/55*
U.S. Cl. 250—372 **7 Claims**

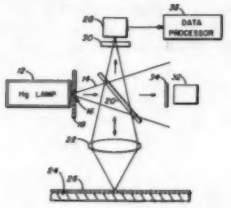
1. A method of measuring a thickness of thin film on a reflective substrate comprising the steps of:

illuminating a portion of a test thin film and substrate with ultraviolet light of a fixed wavelength corresponding to a persistent spectral line;

measuring the intensity of the ultraviolet light reflected from the test thin film and substrate;

providing a standard reflectivity calibration of a known thickness of the thin film on a substrate of known reflectivity, at the wavelength λ, the standard calibration including an intensity of reflected ultraviolet light;

determining the light intensity reflectivity R of the test thin film and substrate by multiplying the known reflectivity



R_0 by the ratio of the reflected light intensity of the test thin film and substrate divided by the reflected light intensity of the standard reflectivity calibration; and

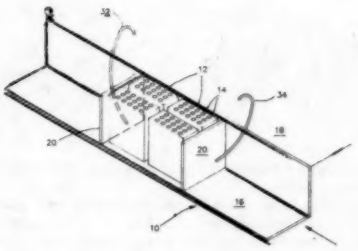
determining the thickness d of the thin film in the test thin film and substrate by inversion of the relation for reflectivity R, expressed as a function of the thin film thickness d.

4,899,056

CLEANING SYSTEM FOR ULTRAVIOLET LIGHT PRODUCING LAMPS

Sidney Ellner, Bedford, N.Y., assignor to Ultraviolet Purification Systems, Inc., Bedford Hills, N.Y.

Filed Jul. 7, 1988, Ser. No. 216,403
Int. Cl.[4] C02F *1/32*
U.S. Cl. 250—431 **11 Claims**



1. In a method of disinfecting waste water wherein ultraviolet light producing lamps are positioned in lamp modules and contained within quartz lamp jackets and wherein said modules are positioned within a flow of said water, a process for removing particulates and films from said lamp jackets comprising removing one or more of said modules from said flow and inserting said removed modules into a tank containing a lamp jacket cleaning agent wherein said lamp jackets are submerged in said cleaning agent and cleaned by direct contact.

4,899,057

SANITARY DEVICE

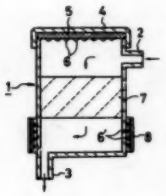
Masashi Koji, Shinjuku, Japan, assignor to Hoshin Kagaku Sangyosho Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 144,033, Nov. 19, 1987, abandoned. This application Jun. 7, 1989, Ser. No. 364,561

Claims priority, application Japan, Mar. 26, 1986, 61-67451; Mar. 26, 1986, 61-67452; Mar. 26, 1986, 61-67453; Mar. 26, 1986, 61-67454

Int. Cl.[4] A61L *2/10*

U.S. Cl. 250—436 18 Claims



1. A sanitation device comprising means for supporting objects to be sanitized and a plurality of semiconductor light emission diodes, each emitting rays of light which prevent proliferation of bacteria, said semiconductor light emission diodes being arranged in such proximity to said objects as to irradiate said objects with a light intensity sufficient to prevent growth of bacteria in or on said objects.

4,899,058

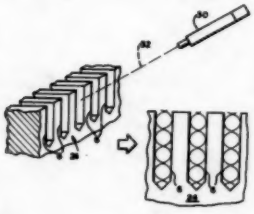
MICROARCHITECTURAL DEEP WELL SURFACES

Jay N. Zemel, Jenkintown, Pa., assignor to Trustees of the University of Pennsylvania, Philadelphia, Pa.

Filed Feb. 26, 1988, Ser. No. 160,779

Int. Cl.[4] G21K *1/00*

U.S. Cl. 250—492.1 2 Claims



1. A method of stimulating quantum states in a microarchitectured surface comprising:

providing a microarchitectured surface,

said surface having a plurality of wells having depths greater than or equal to 45 micrometers,

said wells having lengths at least about two times less than said depths and uniform repeat distances on the order of said depths,

illuminating said surface with radiation, and

allowing quantized standing waves to be formed in said wells of said microarchitectured surface.

4,899,059

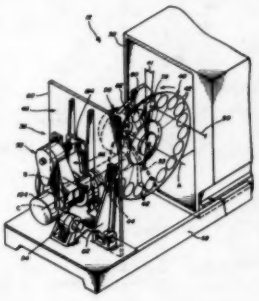
DISK SCANNING APPARATUS FOR BATCH ION IMPLANTERS

Avrum Freytsis, Swampscott; Richard J. Hertel, Boxford, and Eric L. Mears, Rockport, all of Mass., assignors to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 195,729, May 18, 1988, abandoned. This application Jun. 9, 1989, Ser. No. 366,202

Int. Cl.[4] H01J *37/20*

U.S. Cl. 250—492.2 36 Claims



1. Apparatus for workpiece translation in an ion beam treatment system, comprising:

a vacuum envelope defining a vacuum chamber;

means for generating an ion beam;

a disk including a plurality of workpiece mounting sites, said disk being positioned within said vacuum chamber so that one of said workpiece mounting sites intercepts said ion beam;

disk drive means for rotating said disk about a disk rotation axis so that said workpiece mounting sites successively intercept said ion beam;

scan arm means for supporting said disk and said disk drive means within said vacuum chamber, said scan arm means extending through said vacuum envelope and being mounted for movement around a scan axis;

scan drive means for scanning said scan arm means about said scan axis so that said disk and said disk drive means move along an arc-shaped path in said vacuum chamber; and

pivot drive means for pivoting said scan arm means, said disk drive means and said disk about a pivot axis to and between a treatment position and a load/unload position for loading and unloading of workpieces.

4,899,060

DIAPHRAGM SYSTEM FOR GENERATING A PLURALITY OF PARTICLE PROBES HAIVNG VARIABLE CROSS SECTION

Burkhard Lischke, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 191,708, May 9, 1988, abandoned. This application Jun. 13, 1989, Ser. No. 368,959

Claims priority, application Fed. Rep. of Germany, May 8, 1987, 3715427

Int. Cl.[4] H01J *1/52, 3/12*

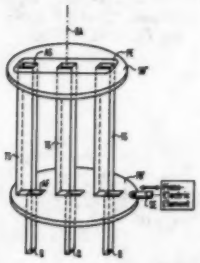
U.S. Cl. 250—505.1 4 Claims

1. A diaphragm system for generating a plurality of particle probes having variable cross sections from a particle beam, comprising:

a first diaphragm for receiving a particle beam and having a first multi-aperture structure;

a second diaphragm disposed following said first diaphragm in a direction of the particle beam, said second diaphragm

having a second multi-aperture structure corresponding to said first multi-aperture structure of said first diaphragm, said first and second diaphragms oriented relative to one another so that in a non-displaced condition apertures of said first multi-aperture structure coincide with corresponding apertures of said second multi-aperture structure; and



means for displacing one of said first or second diaphragms in a plane perpendicular to the direction of the particle beam.

4,899,061

DETERMINING A WIDTH AND/OR THICKNESS OF A GENERALLY RECTANGULAR OBJECT

Hendrik C. Van Hoek, Wantirna, and Daryl N. Williams, Mount Waverley, both of Australia, assignors to The Broken Hill Proprietary Company Limited, Victoria, Australia

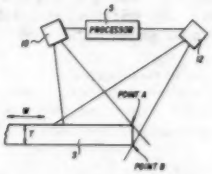
PCT No. PCT/AU87/00237, § 371 Date Mar. 11, 1988, § 102(e) Date Mar. 11, 1988, PCT Pub. No. WO88/01366, PCT Pub. Date Feb. 25, 1988

PCT Filed Jul. 27, 1987, Ser. No. 191,143

Claims priority, application Australia, Aug. 13, 1986, PH07429

Int. Cl.[4] G01N *21/86*

U.S. Cl. 250—560 **7 Claims**



1. A method of determining a dimension of an article, said method comprising the steps of:

viewing four points on the article with a sensing means to obtain image positions of said four points, said four points comprising first and second pairs of points being displaced by known relationships;

using the known relationships between the first pair of points and the image positions of the first pair of points to determine a location in space of one of said first pair of points;

using the known relationships between the second pair of points and the image positions of the second pair of points to determine a location in space of one of said second pair of points; and

using the location in space of the said one point of the first pair of points and the location in space of the said one point of the second pair of points to determine a dimension of said article between said one point of the first pair of points and said one point of the second pair of points.

4,899,062

PROCESS AND APPARATUS FOR THE GENERATION OF TRANSMISSION CURRENT SIGNALS IN AN ALTERNATING CURRENT DISTRIBUTION NETWORK

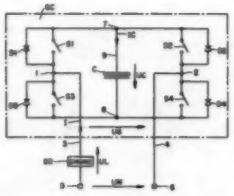
Bernhard Konrad, Wetzikon, Switzerland, assignor to Zellweger Uster AG, Uster, Switzerland

Filed Dec. 8, 1987, Ser. No. 130,196

Claims priority, application Switzerland, Dec. 9, 1986, 04893/86

Int. Cl.[4] H02J *3/02*; H04M *11/04*

U.S. Cl. 307—3 **43 Claims**



1. A method for the generation of transmission current signals in an alternating current distribution network comprising the steps of:

generating an exchange current by means of a transmitter connected to said network, said transmitter including a non-resonant circuit, said non-resonant circuit having at least two energy storage devices to provide for a mutual exchange of energy between said energy storage devices, and said transmitter including at least two switches to control the exchange of energy between said energy storage devices, and

operating said switches to control the flow of said exchange current over said network to thereby produce a series of current impulses forming the transmission signal such that the resulting transmission signal corresponds at least approximately to a desired theoretical signal.

4,899,063

POWER WINDOW SWITCH FOR AN AUTOMOBILE

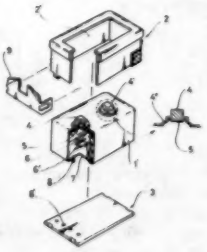
Yoon-Gi Suck, Sinbanpo 7th Apartment 301-608, 130-17, Chamwon-Dong, Seocho-Ku, Seoul, Rep. of Korea

Filed Jul. 29, 1988, Ser. No. 225,920

Claims priority, application Rep. of Korea, May 13, 1988, 88-5607

Int. Cl.[4] H01H *13/70*

U.S. Cl. 307—9.1 **13 Claims**



1. A power window switch for an automobile, comprising:

a printed circuit board which includes a switching circuit;

a casing secured to said circuit board;

a contact plate which includes a first fixed contact, and said contact plate being secured within said casing;

a first button which includes an elastic slope portion, said elastic slope portion secured to said casing;

a first conductive rubber contact secured to a surface of said button, and said first button being positioned with respect to said first fixed contact such that, when said elastic slope portion is in a non-compressed state, said first conductive rubber contact is in a spaced relationship with said first fixed contact and when said elastic slope portion is in a compressed state said first conductive rubber contact is in contact with said first fixed contact; and

said switching circuit including a first up-circuit comprised of an up-switch, said up-switch including said first fixed contact, and said first fixed contact including two first fixed contact points one of which is connected to an input power source line the other of which is connected in parallel with a first resistance (R1) and a second resistance (R2), said first resistance (R1) being connected to the collector of a first transistor (Q12) and the base of a second transistor (Q1), the collector of ssid second transistor (Q1) being connected through a third resistance (R3) to the input power source line, the output terminal of said second transistor (Q1) being connected to the base of a third transistor (Q9) so as to apply a bias power and also through a fourth resistance (R4) to ground, the collector of said third transistor (Q9) being connected through a fifth resistance (R6) to the input power source line, and the emitter of said third transistor (Q9) being connected to the base of a fourth transistor (Q6), the emitter of a fifth transistor (Q3), operating point symmetrically, being connected to the input power source line and the base of said fifth transistor (Q3) being connected to the emitter of a sixth transistor (Q7), the base of said sixth transistor (Q7) being connected through a first diode to the collector of said second transistor (Q1) in parallel with said third resistance (R3), and the output of said sixth transistor (Q7) being connected through a sixth resistance (R5) to ground, a first load line extending from the collector of said fifth transistor (Q3), a second load line extending from the collector of said fourth transistor (Q6), a load connected between a first point on said first load line and a second point on said second line, said second resistance (R2) connected at one end to said input power source line and at the other end to the base of a seventh transistor (Q11), the collector of said seventh transistor (Q11) being connected to the base of an eighth transistor (Q2) and the emitter of said seventh transistor (Q11) being connected to ground.

4,899,064

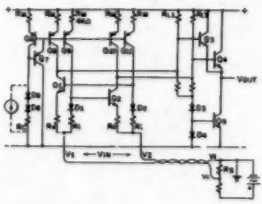
ABSOLUTE VALUE DIFFERENTIAL AMPLIFIER

Robert A. Neidorff, Bedford, N.H., assignor to Unitrode Corporation, Lexington, Mass.

Filed Jun. 1, 1988, Ser. No. 201,476

Int. Cl.[4] H03K *5/00*

U.S. Cl. 307—261 **11 Claims**



1. An absolute value amplifier, comprising:

a first and a second input transistor connected to receive an input signal and each having a corresponding output signal;

a current source connected to said first and said second transistors providing an equal flow of current through each of said first and said second transistors, wherein

said first and said second transistors are responsive to opposite polarity of said input signal;

a first and second output means coupled to receive the output signals of said first and said second transistor and having a common connected output providing an amplifier output corresponding to the absolute value of said input signal.

4,899,065

PRE-DRIVE CIRCUIT

Shigeo Nakamura, Minamitsuru, Japan, assignor to Fanuc Ltd, Minamitsuru, Japan

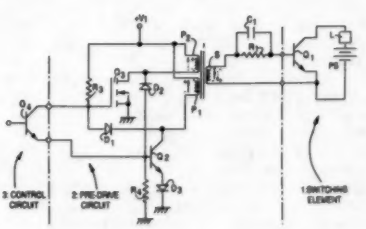
PCT No. PCT/JP88/00403, § 371 Date Oct. 31, 1988, § 102(e) Date Oct. 31, 1988, PCT Pub. No. WO88/08643, PCT Pub. Date Nov. 3, 1988

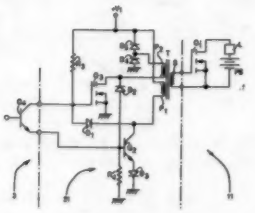
PCT Filed Apr. 25, 1988, Ser. No. 265,677

Claims priority, application Japan, Apr. 30, 1987, 62-107253

Int. Cl.[4] H03K *17/00, 3/30*

U.S. Cl. 307—270 **7 Claims**





1. A pre-drive circuit, for on/off control of a switching transistor element, including a pulse transformer having two primary windings, comprising:

first and second switching elements, each having a signal output terminal and a control terminal, and one being associated with each of the primary windings, which control currents flowing through the respective primary windings; and

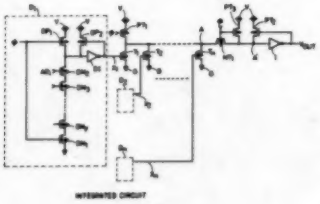
feedback circuits which cross-connect the signal output terminals and the control terminals of said first and second switching elements.

4,899,066

OR-TYPE CMOS LOGIC CIRCUIT WITH FAST PRECHARGING

Masatoshi Aikawa; Hiromasa Nakagawa, and Tsunenori Umeki, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 7, 1986, Ser. No. 848,563
Claims priority, application Japan, Jan. 20, 1985, 60-135333
Int. Cl.[4] H03K *19/017, 19/094;* G11C *7/00, 11/40*
U.S. Cl. 307—45.2 4 Claims



1. An OR-type CMOS logic circuit with fast precharging comprising:

a single data line having a first portion and a second portion;

a plurality of MOS transistors connected to said first portion of said single data line in a wired OR manner, said plurality of MOS transistors operative in response to address decode signals;

inverter means connected to said second portion of said single data line for outputting a signal on said second portion of said single data line;

an MOS transistor connected to the input of said inverter for stabilizing an input signal of said inverter means, said MOS transistor operative in response to the output of said inverter;

a first precharging MOS transistor connected to said first portion of said single data line for precharging said first portion of said single data line to a predetermined level in response to a precharging signal;

a second precharging MOS transistor connected to said second portion of said single data line for precharging said second portion of said single data line to said predetermined level in response to said precharging signal; and

an isolating MOS transistor interposed between said first and second portions of said single data line for isolating said first portion of said single data line from said second portion of said single data line in response to said precharging signal.

4,899,067

PROGRAMMABLE LOGIC DEVICES WITH SPARE CIRCUITS FOR USE IN REPLACING DEFECTIVE CIRCUITS

Hock-Chuen So, Milpitas, and Sau-Ching Wong, Hillsborough, both of Calif., assignors to Altera Corporation, Santa Clara, Calif.

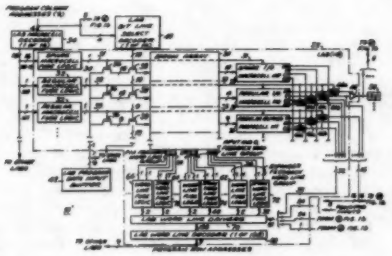
Filed Jul. 22, 1988, Ser. No. 222,832
Int. Cl.[4] H03K *19/003*
U.S. Cl. 307—465 15 Claims

1. A programmable logic device having a plurality of first conductors and a plurality of second conductors, each of said second conductors being programmably interconnectable to each of said first conductors for producing on each of said second conductors a signal which is a logical function of the signals on the first conductors to which said second conductor is interconnected, said programmable logic device comprising:

preprogrammable means associated with each of the conductors in at least one of said pluralities of conductors for producing an output indication of whether or not the associated conductor is to be used; and

signal diverting means responsive to an output indication from said preprogrammable means that a particular conductor is not to be used for diverting the signals associated with said particular conductor to another conductor in the same plurality;

wherein the plurality of conductors with which said preprogrammable means is associated includes a spare conductor for use in the event that one of the conductors in the same plurality, which are referred to as regular conductors, is not to be used, wherein said regular conductors are disposed in an ordered sequence on said programmable logic



device, and wherein said signal diverting means comprises;

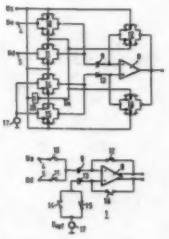
means responsive to an output indication from said preprogrammable means that a particular regular conductor is not to be used for shifting the signals associated with said particular regular conductor and any regular conductors to one side of said particular regular conductor in said ordered sequence to the corresponding next adjacent regular conductor in the direction of said shifting, the last of the shifted signals being diverted from the last of said regular conductors to said spare conductor.

4,899,068

COMPARISON CIRCUIT WITH ERROR COMPENSATED MOS SWITCHES

Hans-Peter Klose, Halstenbek; Kurt König, Hamburg, and Wolfgang Schwartz, Hamburg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 18, 1988, Ser. No. 220,634
Claims priority, application Fed. Rep. of Germany, Jul. 18, 1987, 3723919
Int. Cl.[4] H03K *3/023, 3/027, 5/24, 17/687*
U.S. Cl. 307—494 6 Claims



1. In an MOS device, a comparison circuit for comparing two input voltages, comprising: a differential amplifier including

a first input supplied through a first capacitor and a switch arrangement during a first time period with a first input

voltage (Ue) and during a second time period, succeeding the first time period, with a second input voltage (Ud) by means of the first capacitor and the switch arrangement,

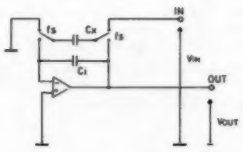
means connecting a second input of the differential amplifier via a second capacitor and a change-over device to a reference voltage source whereby the change-over device alternately connects the second capacitor to the reference voltage source during said first and second time periods, and second means connecting an output of the differential amplifier during the first time period to the first and the second input thereof.

4,899,069

INTEGRATED ACTIVE LOW-PASS FILTER OF THE FIRST ORDER

Germano Nicollini, Piacenza, Italy, assignor to SGS-Thomson Microelectronics s.r.l., Brianza, Italy

Filed Dec. 16, 1988, Ser. No. 285,204
Claims priority, application Italy, Dec. 22, 1987, 83685 A/87
Int. Cl.[4] H03B *1/00*; H03K *5/00*
U.S. Cl. 307—520 **1 Claim**



1. An integrated, low-pass, active filter of the first order operable for producing an output signal at an output terminal thereof in function of a signal applied to an input terminal thereof and comprising an operational amplifier having an inverting input and a noninverting input and a single output coinciding with said output terminal of the filter and provided with a negative feedback network which comprises a continuous integration capacitor connected between said output terminal of the filter and said inverting input of the operational amplifier, the noninverting input of which being connected to ground, and characterized by comprising

a single switched capacitor and two switches operating at a preset frequency;

a first armature of said switched capacitor being switched by a first one of said two switches between said inverting input of the operational amplifier and ground;

a second armature of said switched capacitor being switched by the other of said two switches between said input terminal and said output terminal of the filter.

4,899,070

BIT LINE SENSE AMPLIFIER FOR PROGRAMMABLE LOGIC DEVICES

Jung-Hsing Ou, San Jose, and Sau-Ching Wong, Hillsborough, both of Calif., assignors to Altera Corporation, Santa Clara, Calif.

Filed Jul. 13, 1988, Ser. No. 218,556
Int. Cl.[4] H03K *3/353, 17/26, 17/28*; G11C *7/02*
U.S. Cl. 307—530 **12 Claims**

1. A programmable logic device comprising:

a bit line conductor;

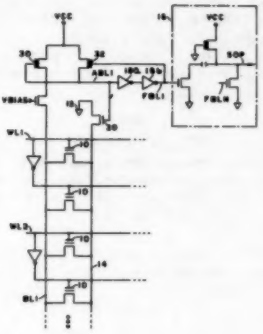
a source of ground electrical potential;

a virtual ground line conductor;

a plurality of word line conductors, each of which conducts an associated word line signal;

a plurality of programmable interconnection devices, each of which, if programmed, is controlled by the word line signal on a respective one of said word line conductors to selectively connect said bit line conductor to said virtual ground line conductor; and

variable current limiting means connected in series between said virtual ground line conductor and said source of ground electrical potential, said variable current limiting means being means responsive to the voltage of the signal



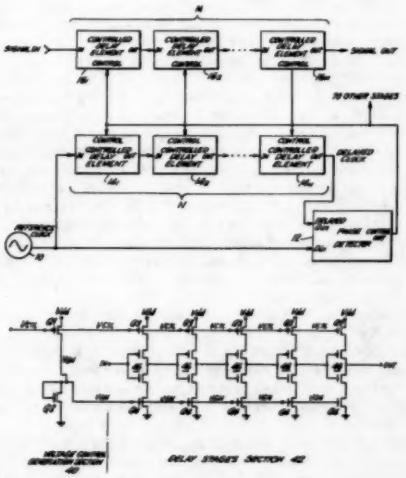
on said bit line conductor so that said variable current limiting means becomes less conductive and conducts less current between said virtual ground line conductor and said source of ground electrical potential as the voltage of the signal on said bit line conductor approaches said ground electrical potential.

4,899,071

ACTIVE DELAY LINE CIRCUIT

Lou Morales, South Setauket, N.Y., assignor to Standard Microsystems Corporation, Hauppauge, N.Y.

Filed Aug. 2, 1988, Ser. No. 227,731
Int. Cl.[4] H03K *5/159, 5/13*
U.S. Cl. 307—605 **4 Claims**



1. A digital delay circuit comprising a first and a second array of an integral number N and M of series-connected controllable delay elements, respectfully, each of said delay

elements being characterized in that the delay established between its input and output is controlled by a control signal applied to a control input thereat, a source of a reference clock, means for delaying said reference clock through one of said first and second arrays of delay elements, thereby to establish a delayed reference clock, means coupled to said clock source and to said first array of delay elements for comparing said reference clock and said delayed reference clock to produce a control signal representative of the comparison between said reference clock and said delayed reference clock, and means for applying said control signal to the control input of each of said controllable delay elements, thereby to vary the delay introduced by each of said delay elements to an input signal.

4,899,072

PULSE MOTOR

Masataka Ohta, Kamakura, Japan, assignor to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

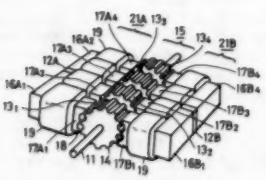
PCT No. PCT/JP87/00685, § 371 Date May 10, 1988, § 102(e) Date May 10, 1988, PCT Pub. No. WO88/02194, PCT Pub. Date Mar. 24, 1988

PCT Filed Sep. 17, 1987, Ser. No. 205,395

Claims priority, application Japan, Sep. 20, 1986, 61-220969; Sep. 20, 1986, 61-220971

Int. Cl.[4] H02K *37/00*

U.S. Cl. 310—49 R **16 Claims**



1. A thin pulse motor comprising:

a rotary shaft;

an array of 2n columnar rotor cores of a soft magnetic material mounted side by side on said rotary shaft in its axial direction, where n is an integer equal to or greater than 2, each of said columnar rotor cores having teeth formed in its peripheral surface at a fixed pitch;

a first flat stator including: a first array of 2n flat magnetic poles arranged side by side in said axial direction, each of said magnetic poles of said first array having flat surfaces parallel to said rotary shaft, and each of said magnetic poles of said first array being disposed opposite a portion of the peripheral surface of a corresponding one of said columnar rotor cores and having a flat-surfaced coil wound thereon; and first flat yoke means for magnetically coupling together at least n of said flat magnetic poles of said first array from one end thereof and for magnetically coupling together at least the remaining ones of said 2n flat magnetic poles of said first array, said 2n magnetic poles of said first array having teeth formed in end faces thereof facing said 2n columnar rotor cores at the same angular pitch as that of said teeth of said columnar rotor cores;

permanent magnet means fixedly mounted at a location selected from the group consisting of said first yoke means and said rotary shaft between the nth and (n+1)th ones of the columnar rotor cores in said columnar rotor core array; and

a second flat stator disposed opposite said first stator across said 2n columnar rotor cores, said second stator including: a second array of 2n flat magnetic poles arranged side by side in said axial direction, each of said magnetic poles of said second array having flat surfaces parallel to said rotary shaft, and each of said magnetic poles of said second array being disposed opposite another portion of the peripheral surface of a corresponding one of said 2n columnar rotor cores and having a flat-surfaces coil wound thereon; and said second flat yoke means for magnetically coupling together at least n of said magnetic poles of said second array and for magnetically coupling together at least the remaining ones of said magnetic poles of said second array; said 2n magnetic poles of said second array having teeth formed in end faces thereof facing said 2n columnar rotor cores at the same angular pitch as that of the teeth of said 2n magnetic poles of said first array; said rotary shaft, said first and second flat yoke means, and said first and second arrays of flat magnetic poles all being disposed in a flat arrangement in a plane which includes said rotary shaft; and the relative angular positions of said teeth of said 2n columnar rotor cores and the teeth of said 2n flat magnetic poles of each of said first and second arrays being displaced 0, ±n, 2/2n, . . . , and (2n−1)/2n times apart from one of said 2n columnar rotor cores.

4,899,073

3-POSITION ROTATIONAL ACTUATOR

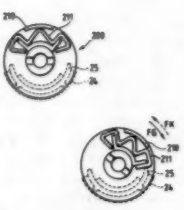
Muneo Takeuchi, Handa; Hiroji Kinbara, Okazaki, and Masafumi Tsuruta, Oobu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 25, 1988, Ser. No. 224,117

Claims priority, application Japan, Jul. 24, 1987, 62-186450; Jul. 24, 1987, 62-186451; Apr. 22, 1988, 63-100867

Int. Cl.[4] H02K *7/00, 33/12*

U.S. Cl. 310—116 **8 Claims**



1. A 3-position rotational actuator comprising:

a yoke;

a stator covered by said yoke and having two pairs of field poles each of which are in spaced and opposed relation to each other, the opposed field poles being excited with opposite polarities;

a rotor made up of a magnet and arranged to be rotatable to take three positions which are a first stable point due to a field produced by one pair of field poles of said stator, a second stable point due to the positive magnetic pole produced by the other pair of field poles of said stator spaced from said first stable point, and a third stable point due to the opposite field;

a base member fixedly secured to said yoke and enclosing said stator and said rotor together with said yoke; and

a rotation limiting member provided on said base member for compulsorily retarding the rotation of said rotor on the way from said first stable point to said second stable point and from said first stable point to said third stable point,

wherein the magnetic flux to said rotor from the other pair of field poles of said stator for rotating said rotor from said first stable point is substantially equal in magnitude to the magnetic flux to said rotor from the one pair of field poles of said stator for maintaining said rotor at said first stable point, and the magnetic flux density of the other pair of field poles of said stator applied to said rotor is smaller that that of the one pair of field poles of said stator.

4,899,074

PERMANENT MAGNET ROTARY DYNAMO ELECTRIC MACHINES

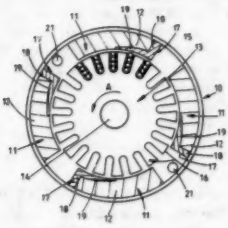
John G. W. West, Pershore, United Kingdom, assignor to Magneti Marelli Electrical Limited, Birmingham, England

Filed Oct. 11, 1988, Ser. No. 255,946

Claims priority, application United Kingdom, Oct. 13, 1987, 8724000

Int. Cl.[4] H02K *1/08*

U.S. Cl. 310—154 **23 Claims**



1. A unidirectional, permanent magnet, direct current, rotary dynamo electric machine comprising a stator, a rotor rotatable relative to the stator and having an air gap between the rotor and the stator, the permanent magnet poles of the machine each including a flux shunt comprising first and second magnetically continuous portions formed from a material of high saturation flux density, each first portion extending from the back iron, upon which its respective pole is mounted, towards the air gap of the machine and being magnetically continuous with the back iron, each first portion being adjacent that end of its respective permanent magnet which is the strong tip end in use and having its end remote from the back iron magnetically continuous with the respective shunt second portion, each shunt second portion extending from the respective shunt first portion circumferentially of the machine towards that end of the respective permanent magnet which is the weak tip end in use, and engaging the air gap face of the respective permanent magnet each second portion in that region thereof which is engaged with the respective permanent magnet being shaped such that its cross-sectional area increases substantially linearly from a minimum at its free end, each shunt first portion having a minimum cross sectional area equal to or greater than the maximum cross sectional area of the respective second portion, and each shunt extending over a maximum of 80% of the pole arc of its respective pole from the strong tip end thereof wherein the circumferential dimension and the positioning of the permanent magnet of each pole is such in relation to the overall pole arc that a gap is defined between the first portion of each shunt and the adjacent end of the respective permanent magnet, wherein the poles are carried by the stator and a, or each, through bolt of the machine is accommodated in said gap of a respective pole.

4,899,075

TWO-PHASE DC BRUSHLESS MOTOR

Yoichi Hasebe, Saku, Japan, assignor to Shinano Kenshi Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 128,090, Dec. 3, 1987, abandoned. This application Dec. 7, 1988, Ser. No. 282,924

Int. Cl.[4] H02K *1/14*

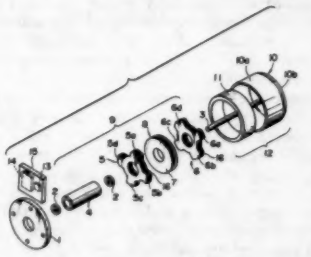
U.S. Cl. 310—257 **16 Claims**

1. A brushless motor comprising:

a cylindrical bobbin-wound coil coaxially mounted on a stator axis and energized in two-phase mode;

first and second annular stator discs coaxially mounted on said stator axis with said coil therebetween;

first and second sets of substantially equally spaced stator poles projecting in a plate-like form and perpendicular to said stator axis from the outer peripheral edges of said first and second stator discs, respectively, said first and second sets of stator poles having protruding ends lying in a common imaginary cylindrical surface and magnetically linked to said coil by the respective one of said first and second stator discs, said stator poles of said first set being equal in number to and angularly spaced approximately 130° electrically from said stator poles of said second set, each stator pole of said first and second sets having a notched portion formed in one of opposite corners of said protruded end thereof and oriented so as to be next to the unnotched corner of said stator pole adjacent thereto;



a rotor coaxially rotatable relative to said stator axis and having permanent magnetic poles equal in number to all of said stator poles and spaced alternately north and south and circumferentially arranged on a cylindrical flange of said rotor to overlap all of said stator poles with a slight annular gap therebetween, each of said permanent magnetic poles having an angular width substantially equal to the sum of angular widths of said protruded end and said notched portion of said stator pole; and

position detecting means opposed to said permanent magnetic poles with a gap left therebetween for detecting the position and polarity of said magnetic pole to thereby switch a direction of direct current charged to said coil.

4,899,076

PIEZOELECTRIC OSCILLATOR

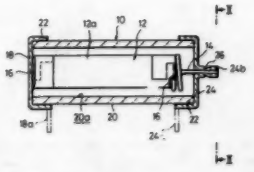
Toshitake Kato, Tokyo, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Jun. 3, 1988, Ser. No. 202,066

Claims priority, application Japan, Mar. 6, 1987, 62-032796; Jun. 5, 1987, 62-086638[U]

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—356 **11 Claims**



1. A piezoelectric oscillator comprising:

a tubular casing means defining therein an axial vacuum chamber extending between opposite ends thereof;

a piezoelectric oscillating element received within said axial vacuum chamber of said tubular casing means;

first and second mutually insulated electrically conductive means arranged at the opposite ends of said tubular casing means for permitting an extraction of an electric oscillating signal from said piezoelectric oscillating element; at

least said first conductive means including a first electric lead means;

a sealing means for hermetically sealing said axial tubular casing means at one end thereof to thereby maintain said chamber of said tubular casing means in a vacuum condition;

elastic support means for elastically supporting one end of said piezoelectric element within said axial vacuum chamber of said tubular casing to thereby protect said piezoelectric oscillating element from thermal stress and impulsive and vibratory forces; and

said elastic support means including a conductive and elastically displacable element having a holding portion for positioning and fixedly holding said one end of said piezoelectric element, a rotationally and axially movable arm portion having one end connected to said holding portion and capable of being rotationally and axially moved in response to a thermal axial displacement of said piezoelectric oscillating element, a torsionally displacable portion connected at one end thereof to the other end of said rotationally and axially movable arm portion, and a fixed end bar portion connected to the other end of said torsionally displacable portion, said rotationally and axially movable arm portion and said torsionally displacable portion performing an elastic absorption action to compensate for said axial and thermal displacement of said piezoelectric oscillating element, said fixed bar portion being attached to said hermetic sealing means, and said second conductive means including at least a second electric lead means electrically connected to the other end of said piezoelectric oscillating element, and cooperating with said first electric lead means of said first conductive means to extract said electric oscillating signal.

4,899,077

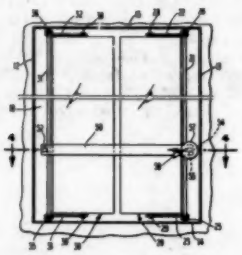
SELF-SERVICE DISPENSING CABINET

Sherman L. Larson, Palmyra, N.J., assignor to Sherman Industries, Inc., Palmyra, N.J.

Filed Jan. 23, 1989, Ser. No. 300,269

Int. Cl.[4] A47B *88/00*

U.S. Cl. 312—325 **2 Claims**



1. Support means for a self-service rear load vendor intended to dispense packaged products from an open face of a pivotable cabinet when facing forwardly and to be restocked through said open face when facing rearwardly, said cabinet being supported on a fixed faceplate, said support means comprising:

a. a vertical hinge rod mounted on said face-plate for pivotal movement about its vertical axis, said rod forming a first pivot axis for said cabinet;

b. a pair of horizontal hinge arms secured to said hinge rod, one arm near the top and the other near the bottom, each hinge arm having a recess at its outward end; and

c. a pair of pivot posts, one post secured to the top surface and another to the bottom surface of said cabinet, said pivot posts being located on a common vertical axis, each pivot post received within a recess in a hinge arm, said pivot posts forming a second pivot axis for said cabinet;

d. the horizontal length of each hinge arm and the pivotal movement of said hinge rod allowing said second pivot axis to be moved to a position such that the horizontal distance between said second pivot axis and said faceplate becomes greater than the horizontal distance between said second pivot axis and any point on the periphery of said cabinet, where said cabinet may be pivoted through at least 180° about said second pivot axis;

e. said cabinet having a forwardly projecting trigger plunger adapted to project through a hole in said fixed faceplate, the length of said horizontal hinge arms and the pivotal movement of said vertical hinge rod being such as to allow said cabinet to be moved rearwrdly and forwardly to allow withdrawal and reinsertion of said trigger plunger along a substantially straight line relative to said hole in said faceplate.

4,899,078

THERMIONIC HAIRPIN CATHODE

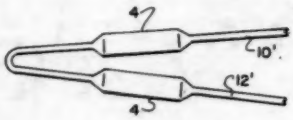
Otto Winkler, Balzers, Liechtenstein, assignor to Balzers Aktiengesellschaft, Furstentum, Liechtenstein

Filed Apr. 12, 1988, Ser. No. 180,850

Claims priority, application Switzerland, Apr. 24, 1987, 01582/87

Int. Cl.[4] H01J *1/16*

U.S. Cl. 313—37 **17 Claims**



1. A hairpin type cathode with longer lifetime especially for use in electron microscopes and other electron-optical instruments, comprising: a hairpin-shaped one piece high melting metal wire having a pair of diverging leg portions and a vertex portion interconnecting said leg portions, said vertex portion acting as a thermionic electron source and each of said leg portions having a connection end, the cross sectional area of the wire being substantially the same throughout said vertex portion and said leg portions, and each of said leg portions having a section of enlarged peripheral surface with respect to the peripheral surface of the vertex portion and of the other parts of the legs, said section of enlarged peripheral surface being short in relation to the leg portion length and being positioned between said vertex portion and said connecting end, so close to the vertex portion, that in operation due to the higher heat radiation losses at said section of enlarged peripheral surface, the temperature gradient adjacent said vertex portion is increased thereby causing a maximum temperature at the vertex portion during the entire lifetime of the cathode.

4,899,079

CATHODE RAY TUBE

Aart A. Van Gorkum; Leopold C. M. Beirens, and Gerardus A. H. M. Vrijssen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 7, 1985, Ser. No. 709,464

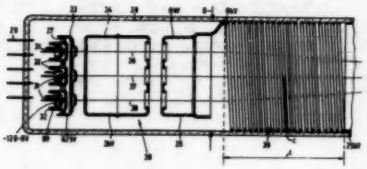
Claims priority, application Netherlands, Mar. 12, 1984, 8400779

Int. Cl.[4] H01J *29/58*

U.S. Cl. 313—412 **10 Claims**

1. An improved cathode ray tube comprising an envelope having a longitudinal axis, a display screen, an electron gun system disposed on said axis for producing and focusing a plurality of electron beams directed at the display screen, and deflection means longitudinally-spaced from said system for deflecting said beams across said screen, wherein the improve-

ment comprises convergence means for converging the beams substantially at the screen independently of said focusing, said convergence means comprising a helically-wound, beam-surrounding resistive element disposed between the electron gun system and the deflection means, said element having a maximized diameter D and extending along the path of propagation



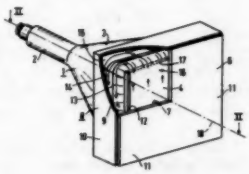
of the electron beams by a length 1 which is no longer than twice said diameter, said element further including longitudinally-separated means for applying predetermined potentials thereto which effect production of a potential gradient along said length to establish a large diameter, high strength electromagnetic convergence lens through which the electron beams pass.

4,899,080

PROJECTION TELEVISION DISPLAY TUBE WITH COOLING MEANS AND DISPLAY DEVICE HAVING SUCH A DISPLAY TUBE

Leendert Vriens; Gerrit B. Gerritsen, and Willem M. Van Alphen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 738,199, May 24, 1985, abandoned.
This application Jan. 18, 1989, Ser. No. 298,378
Claims priority, application European Pat. Off., Jun. 1, 1984, 84200784
Int. Cl.[4] H01J 29/86, 5/20
U.S. Cl. 313—477 R 15 Claims



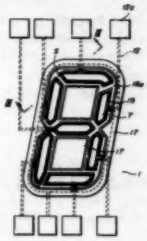
1. A projection television display tube having an evacuated envelope with a display window which on its inside comprises a display screen and in front of which a light permeable second window is provided on its outside, a cooling liquid flowing through the space between the display window and the second window from at least one inlet aperture to at least one outlet aperture, namely by temperature differences in said cooling liquid, characterized in that around the tube end at the area of the windows and the space a cooling jacket comprising an outer wall is provided which together with at least an outer peripheral edge of the second window defines at least one duct which transports the cooling liquid around the periphery of the window from the outlet aperture to the inlet aperture of the said space.

4,899,081

FLUORESCENT DISPLAY DEVICE

Takao Kishino; Minoru Katayama; Kazuyuki Yano, and Isao Ohtsuka, all of Mobara, Japan, assignors to Futaba Denshi Kogyo K.K., Mobara, Japan

Filed Sep. 30, 1988, Ser. No. 252,052
Claims priority, application Japan, Oct. 2, 1987, 62-250392
Int. Cl.[4] H01J 63/02
U.S. Cl. 313—496 3 Claims



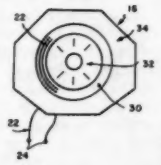
1. A fluorescent display device comprising:
an insulating substrate;
phosphor-deposited anodes arranged on said insulating substrate;
grids arranged on said insulating substrate in proximity to said anodes;
filamentary cathodes stretched above said anodes;
said grids each being constituted by a metal film section arranged on said substrate, an insulating layer section laminatedly arranged on said metal film section in a manner to expose a peripheral portion of said metal film section surrounding said anode and a conductive layer section laminatedly arranged on said insulating layer section so as to be electrically connected to said metal film section.

4,899,082

APPARATUS FOR COMPENSATING FOR IMAGE ROTATION IN A CRT DISPLAY

Robert M. Sands, Tyngsboro, and John J. Fitzgerald, Leominster, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 30,459, Mar. 25, 1987, abandoned. This application May 13, 1988, Ser. No. 195,401
Int. Cl.[4] H01J 29/06
U.S. Cl. 315—8 3 Claims



1. A video display unit for displaying an image on a screen, said unit being subject to an external magnetic field, said external magnetic field causing a rotation of said image with respect to said screen, said unit comprising:
A. cathode ray tube means, said tube means including an electron gun and a screen, said gun for emitting an electron beam along a path toward said screen, said beam for forming an image on said screen;

B. deflection yoke means, said yoke means being disposed between said electron gun and said screen, said yoke means operating to deflect said electron beam, thereby forming said image, said yoke means having a first end juxtaposed with said screen and a second end juxtaposed with said electron gun, said first end including a recessed area,

1. said yoke means further including a conductive winding having first and second ends, said winding being substantially disposed in said recessed area, said winding oriented substantially transverse to said path; and

C. control means, said control means coupled to said first and second ends of said winding, said control means for producing a compensation current which is conducted through said winding, said compensation current producing a compensating magnetic field for substantially canceling said external magnetic field.

4,899,083

AUTOMATIC LIGHTING SYSTEM FOR AUTOMOBILE

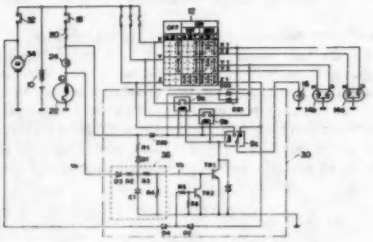
Sachiro Katsoka, Ebina; Yukio Yamamoto, Atsugi, and Saburo Okai, Ayase, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 23, 1986, Ser. No. 854,922

Claims priority, application Japan, Apr. 26, 1985, 60-88740; Apr. 26, 1985, 60-88741

Int. Cl.[4] B60Q *1/02*

U.S. Cl. 315—77 **9 Claims**



5. An automatic lighting system for an automobile including an engine, an electric power source, an ignition switch, a fuse, an alternator having one terminal connected via the fuse and the ignition switch to the electric power source and an opposite grounded terminal, a stator motor switch, and a stator motor for cranking the engine connected via the stator motor switch to the electric power source, the system comprising:

electrically responsive lights;

a manual lighting switch connected between the electric power source and said lights for selectively supplying current from the electric power source to said lights;

bypass circuit means connected between the electric power source and said lights to bypass said manual lighting switch and supply current from the electric power source to said lights when the bypass circuit means is closed;

bypass circuit driver means having one end connected via the fuse and the ignition switch to the source of electric power source and an opposite end grounded, said bypass circuit driver means being energized in response to a stable engine operating condition indicating voltage signal being derived at the one terminal of the alternator, said bypass circuit driver means closing siad bypass circuit means;

means cooperating with said manual lighting switch for opening said bypass circuit driver means when said manual lighting switch is closed thereby to open said bypass circuit means when said manual lighting switch is closed; and

means for supplying current from the electric power source to said bypass circuit driver means to bypass the fuse and the ignition switch and hold said bypass circuit driver means closed once said bypass circuit driver means has been closed.

4,899,084

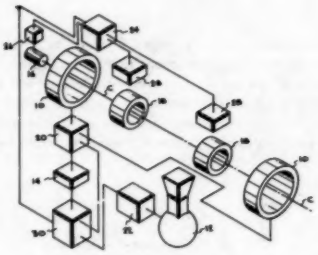
PARTICLE ACCELERATOR EMPLOYING TRANSIENT SPACE CHARGE POTENTIALS

Richard F. Post, Walnut Creek, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 25, 1988, Ser. No. 160,384

Int. Cl.[4] H05H *5/00*; H01J *7/24*

U.S. Cl. 315—111.81 **16 Claims**



1. An method of accelerating ions or charged particles, comprising the steps of:

generating a plasma of electrons and ions confined in a magnetic mirror field with a central axis;

heating the plasma electrons to high temperatures;

directing an ion or particle beam substantially along the central axis of the magnetic mirror field; and

pulsing one or more local coils aligned substantially along the central axis of the magnetic mirror field, as the ions or charged particles pass the local coils wherein each local coil is pulsed rapidly so that the local coil increases the magnetic field substantially along the central axis of the magnetic mirror field near that local coil, thus generating a transient positive space charge which accelerates the ion or particle beam.

4,899,085

IGNITING DEVICE FOR A HIGH-PRESSURE DISCHARGE LAMP CAPABLE OF BATTERY VOLTAGE COMPENSATION

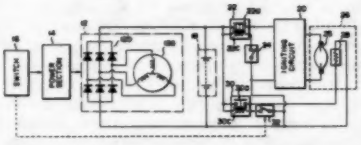
Mitsutoshi Kimura, Yokohama, and Yasuhiro Nieda, Yokosuka, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 924,035, Oct. 28, 1986, abandoned. This application Feb. 19, 1988, Ser. No. 161,247

Claims priority, application Japan, Oct. 28, 1985, 60-240963

Int. Cl.[4] H01K *1/62*; H01J *17/34*

U.S. Cl. 315—116 **20 Claims**



1. An operating apparatus for a high-pressure discharge lamp having a light-emitting tube and a heater, said operating

apparatus receiving power from a power source having a battery, charging means for charging the battery, and charging switch means for causing said charging means to start and stop the charging of said battery, said operating apparatus comprising:

operating circuit means, including light switch means independent of heater operation and lighting circuit means, for receiving the power supplied from said power source and for generating a predetermined output only when said light switch means is turned on so as to start and maintain an ON state of said light-emitting tube;

heater switch means, operated independently of said light switch means, for causing said heater to operate independently of an operating state of said light switch means; and

heater control means for enabling power to be supplied to said heater by turning on said heater switch means only when said charging means is operated, and for turning off said heater switch means whenever said charging switch means is turned off.

4,899,086

ELECTROLUMINESCENCE LIGHT EMISSION APPARATUS

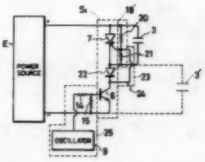
Shinji Hirata, and Katsumi Horinishi, both of Osaka, Japan, assignors to West Electric Company Ltd., Osaka and Canon, Inc., Tokyo, both of, Japan

Filed Dec. 28, 1987, Ser. No. 138,487

Claims priority, application Japan, Dec. 29, 1986, 61-311074; Dec. 29, 1986, 61-311075; Dec. 29, 1986, 61-201315[U]

Int. Cl.[4] H05B *41/36*

U.S. Cl. 315—169.3 **16 Claims**



15. An electroluminescence light emission apparatus powered by a DC supply voltage produced from first and second output terminals of a power source, comprising:

first and second switch circuits connected in parallel between said power source terminals, each of said switch circuits comprising a thyristor, a diode and a switch element having a control electrode, said thyristor, diode and switch element being successively connected in series, with a cathode of said thyristor connected to an anode of said diode;

control means coupled to the control electrodes of said switching elements of said first and second switch circuits, for setting said switching elements in a conducting state and a non-conducting state respectively in a mutually alternating manner; establishing a first operating condition in which said switch element is held in a conducting state and a second operating condition in which said switch element is held in a non-conducting state;

an electroluminescence element coupled between the point of connection of the thyristor and diode of said first switch circuit and the thyristor and diode of said second switch circuit;

first gate bias circuit means coupled to a gate electrode of the thyristor of said first switch circuit and driven by a flow of current produced through said electroluminescence element when the switch element of said second switch circuit is set in the conducting state, to set said thyristor of the first switch circuit in the conducting state, and second gate bias circuit means coupled to a gate electrode of the thyristor of said second switch circuit and driven by a flow of current produced through said electroluminescence element when the switch element of said first switch circuit is set in the conducting state, to set said thyristor of the second switch circuit in the conducting state; and, first reverse bias circuit means for applying a voltage drop developed across the diode of said first switch circuit while the switch element of said first switch circuit is in the conducting state, as a reverse bias to the gate electrode of the thyristor of said first switch circuit, and second reverse bias circuit means for applying a voltage drop developed across the diode of said second switch circuit while the switch element of said second switch circuit is in the conducting state, as a reverse bias to the gate electrode of the thyristor of said second switch circuit.

4,899,087

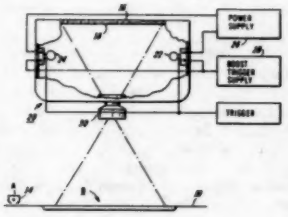
TRIGGERING CIRCUIT FOR SERIES CONNECTED FLASH LAMPS

Thomas J. Hammond, and Lawrence J. Mason, both of Penfield, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 014,001, Feb. 12, 1987, abandoned. This application Apr. 8, 1988, Ser. No. 180,680

Int. Cl.[4] H05B *37/00*

U.S. Cl. 315—241 P **5 Claims**



1. A circuit for causing high speed, repetitive discharge of a pair of flash lamps connected in series, said circuit comprising:

a main dc power supply connected across said series connected flash lamps, said main power supply adapted to provide the flash energy to said lamps to sustain discharge;

a trigger circuit for initiating flash operation by providing a low level trigger signal to each lamp and

a preflash boast voltage circuit for providing a boost voltage across a first flash lamp and across a common electrical connection between the two lamps, said boost voltage circuit including an auxilary dc power supply, for charging a boost capacitor connected in parallel across said first lamp and further including a blocking impedance connected between said capacitor and said common electrical connection, said boost voltage circuit adapted to charge said boost capacitor prior to initiation of flash operation,

whereby, when flash operation is initiated, said trigger signals are applied initiating current flow in both lamps and the boost voltage is applied across said first lamp lowering the impedance of said first lamp and accelerating the breakdown of the second lamp.

4,899,088

POWER CONTROL CIRCUIT FOR INDUCTIVE LOADS

Robert A. Black, Jr., Brooklyn Park, and Arlon D. Kompelien, Cross Lake, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 31, 1988, Ser. No. 239,209

Int. Cl.[4] H05B *41/36*

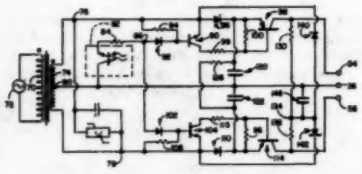
U.S. Cl. 315—291 **24 Claims**

1. Apparatus for use with an inductive load having first and second terminals and which is normally supplied with alternat-

ing current by a source connected to the first and second terminals but which may be interrupted from connection with the source for predetermined time periods during the Positive and negative portions of the current supplied, the apparatus operable to provide a current path, only during the predetermined time periods, for any accumulated charge in the load comprising:

first and second unidirectional conductors each poled to conduct current from an input to an output terminal thereof;

first and second unidirectional switches each having a control terminal operable upon receipt of control signals to turn the switches "on" and "off", each switch being poled to conduct current from an input terminal to an output terminal thereof only when activated to an "on" condition by a control signal at the control terminal;



control means operable to produce a first output during substantially only the predetermined time periods occurring in the positive portions of the current supplied by the source and a second output during substantially only the predetermined time periods occurring in the negative portions of the current supplied by the source; and

connection means connecting the output terminals of the first and second conductors and the input terminals of the first and second switches to the first and second terminals of the load, respectively, connecting the input terminals of the first and second conductors to the output terminals of the first and second switches and connecting the control terminals of the first and second switches to the control means, the first output of the control means providing the control signal to turn the second switch "on" and the second output of the control means providing the control signal to turn the first switch "on".

4,899,089

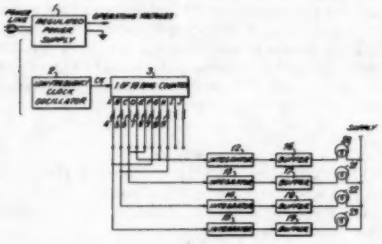
TIME-VARIABLE ILLUMINATING DEVICE

Dorothy E. Hayes, 30 E. 4th St., New York, N.Y. 10003

Continuation of Ser. No. 863,801, May 9, 1986, abandoned. This application Oct. 2, 1987, Ser. No. 106,980

Int. Cl.[4] H05B *37/00*

U.S. Cl. 215—323 **2 Claims**



1. A device comprising:

an opaque base having a plurality of light sources;

a translucent block secured to the base for illumination by said light sources, said block being partitioned into zones differentiated by different optical characteristics; and

a control circuit disposed in said base for activating and deactivating said light sources in a preselected sequence; said control circuit comprising only:

a pulse generator for generating clock pulses;

a single ring counter operatively connected to said pulse generator, and having a plurality of outputs, each output being provided to generate output pulses sequentially in response to said clock pulses; and

a plurality of integrators each being coupled to one of the light sources, each said integrator being connected directly to at least one ring counter output for generating a shaped pulse in response to a respective output pulse for activating said one of said light sources wherein the control circuit further comprises a buffer interposed between an integrator and a corresponding light source and wherein the integrator comprises an operational amplifier with an amplified output and the buffer comprises a transistor with a base connected to the amplifier output and a collector in series with said light source.

4,899,090

RARE GAS DISCHARGE LAMP DEVICE

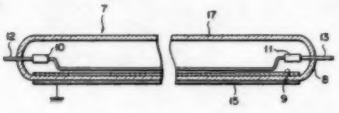
Yoshiji Yoshike, Yokosuka, and Yoshinori Satou, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 55,610, May 29, 1987, abandoned. This application Jan. 17, 1989, Ser. No. 298,256

Claims priority, application Japan, May 30, 1986, 61-124974; Aug. 29, 1986, 61-203348

Int. Cl.[4] H05B *41/00*

U.S. Cl. 315—335 **24 Claims**



1. A rare gas discharge lamp for producing light using a predetermined voltage comprising:

an elongated bulb having an inner and an outer surface;

a rare gas sealed inside said bulb;

a pair of internal electrodes provided within said bulb and set apart from each other along the longitudinal axis of said bulb, a positive column being produced when the predetermined voltage is applied between said internal electrodes,

a phosphor layer formed on said inner surface of said bulb, and

means, disposed on said outer surface of said bulb in a region between said electrodes and kept at ground potential, for attracting said positive column toward a portion of said inner surface of said bulb which is close to said attracting means to maintain a potential difference between said attracting means and said positive column between said internal electrodes throughout operation of said rare discharge lamp to obtain a uniform light emission.

4,899,091

CATHODE-RAY-TUBE ASTIGMATISM CORRECTION APPARATUS

Conrad J. Odenthal, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Continuation-in-part of Ser. No. 614,510, May 29, 1984, abandoned. This application Mar. 5, 1985, Ser. No. 708,602

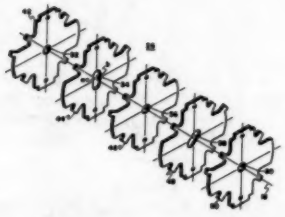
Int. Cl.[4] H01J *29/58, 29/50, 29/74*

U.S. Cl. 315—382 **26 Claims**

1. Astigmatism correction apparatus for an electromagneti-

cally deflected cathode-ray-tube having an electron gun including beam-forming, accelerator and focusing electrodes forming an electron beam and an electromagnetic deflection yoke which establishes two orthogonal deflection fields and deflects said electron beam across a screen of said cathode-ray-tube in response to beam deflection signals applied to said electromagnetic deflection yoke, and wherein said magnetic deflection yoke produces distortion of said electron beam, said apparatus comprising:

electrostatic correction means disposed along said electron beam and through which said electron beam passes before reaching said deflection yoke, said electrostatic correction means, comprising at least first, second and third plate-form electrodes spaced along the direction of the electron



beam and each having an aperture through which said beam passes, the aperture in the first electrode being non-circular and being elongated in a direction parallel to one of the two deflection fields, the aperture in the third electrode being non-circular and being elongated in a direction intermediate the directions of the two deflection fields, and the aperture in the second electrode, which is disposed between the first and third electrodes, being circular, and

means connected to said electrostatic correction means and responsive to the beam deflection signals for varying the electrostatic field produced by said electrostatic correction means to compensate dynamically for the distortion caused by said deflection yoke at a plurality of predetermined locations on said screen.

4,899,092

JUXTAPOSED DISCHARGE TUBES WITH OPPOSED TRIGGER ELECTRODES

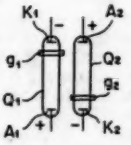
Kenji Tsuji, and Tsutomu Ichikawa, both of Kashiwara, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 101,814, Sep. 28, 1987, abandoned. This application Jun. 2, 1989, Ser. No. 361,829

Claims priority, application Japan, Sep. 29, 1986, 61-230778

Int. Cl.[4] H01J *61/54*

U.S. Cl. 313—594 **4 Claims**



1. In a light emitting device which includes a plurality of discharge tubes arranged in a juxtaposed relationship and each having first and second electrodes to which energy for emitting light is applied and a trigger electrode to which a predetermined voltage to trigger energization of the corresponding discharge tube is applied, and wherein said discharge tubes are selectively controlled such that one of said discharge tubes is selectively caused to emit light or some or all of said discharge tubes are caused to emit light at the same time, the improvement wherein the trigger electrodes of each adjacent ones of said discharge tubes are located at opposite positions to each other with respect to the adjacent discharge tubes, wherein the trigger electrodes of each adjacent ones of said discharge tubes are located in a spaced relationship in a direction of the length of the discharge tubes by a distance insufficient to induce discharging of one of the adjacent discharge tubes when a predetermined voltage is applied to a trigger electrode of a different adjacent discharge tube to cause discharging of the latter.

4,899,093

CIRCUITRY FOR ELECTRONICALLY COMMUTATING A DIRECT-CURRENT MOTOR

Günter Gleim, Villingen-Schwenningen, Fed. Rep. of Germany, assignor to Deutsche-Thomson Brandt GmbH, Villingen, Fed. Rep. of Germany

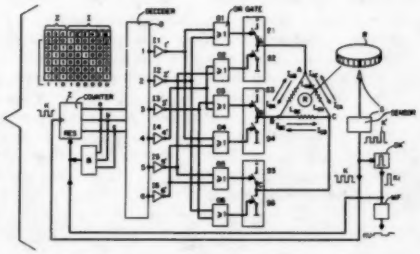
PCT No. PCT/EP87/00494, § 371 Date Apr. 29, 1988, § 102(e) Date Apr. 29, 1988, PCT Pub. No. WO88/01807, PCT Pub. Date Mar. 10, 1988

PCT Filed Sep. 2, 1987, Ser. No. 192,519

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1986, 3630312

Int. Cl.[4] H02P *6/02*

U.S. Cl. 318—254 **11 Claims**



1. A circuit for electronically commutating a multiphase direct-current motor having a stator and a rotor with a circumference, comprising: a predetermined number of markers distributed around said circumference of said rotor; said motor having phase windings; a sensor for detecting said markers and generating corresponding commutating pulses to activate said phase windings; a counter advanced by said pulses, said counter having a plurality of outputs; a plurality of switches controlled by said outputs for connecting said phase windings alternately to an operating voltage and to a reference voltage; said counter resetting itself to zero after receiving a predetermined number of commutating pulses that is a whole-number divisor of said predetermined number of markers; and an additional marker on said stator for resetting said counter from outside of said counter so that said stator applies a torque to said rotor which is always optimum and phase displacement is prevented.

4,899,094

METHOD OF CALIBRATION FOR AN AUTOMATIC MACHINE TOOL

David I. Pilborough, Wotton-under-Edge, United Kingdom, assignor to Renishaw plc, England

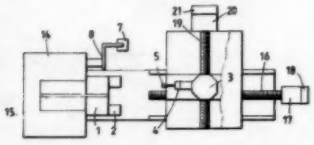
PCT No. PCT/GB87/00644, § 371 Date May 9, 1988, § 102(e) Date May 9, 1988, PCT Pub. No. WO88/02139, PCT Pub. Date Mar. 24, 1988

PCT Filed Sep. 16, 1987, Ser. No. 194,571

Claims priority, application United Kingdom, Sep. 16, 1986, 8622218

Int. Cl.[4] G05B *19/24*

U.S. Cl. 318—567 **6 Claims**



1. A method of calibration for an automatic machine tool having workpiece-holding means which is rotatable about an axis for machining a workpiece held therein, data processing means, and a trigger probe, which probe can be triggered against a point on the surface of the workpiece, in response to which the data processing means produces information representative of positional co-ordinates of the probe at the trigger point, the co-ordinates being with respect to a datum point which is based upon an assumed position of the axis of rotation of the workpiece holding means, the method comprising:

(a) calibrating the probe, by triggering it against at least one point on an item having a known dimension and, using said dimension and a positional co-ordinate of the or each trigger point as indicated by the data processing means, computing a probe correction offset; and

(b) calibrating the machine tool, by providing a physical feature having an axis of rotation centered with respect to the actual position of the axis of rotation of the workpiece holding means; triggering said probe against first and second points on said feature; and, on the basis of the mean of respective positional co-ordinates of the trigger points as indicated by the data processing means, corrected by the probe correction offset, computing an offset Xe related to the difference, if any, between the actual position and the assumed position of the axis of rotation of the workpiece holding means.

4,899,095

ROBOT CONTROL SYSTEM

Hajime Kishi, Hino; Shinsuke Sakakibara, Komae, and Tatsuo Karakama, Hachioji, all of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP86/00319, § 371 Date Feb. 25, 1987, § 102(e) Date Feb. 25, 1987, PCT Pub. No. WO87/00310, PCT Pub. Date Jan. 15, 1987

PCT Filed Jan. 24, 1986, Ser. No. 32,519

Claims priority, application Japan, Jun. 25, 1985, 60-138334

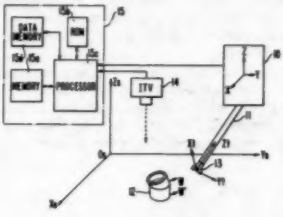
Int. Cl.[4] G05B *19/42*

U.S. Cl. 318—568.16 **6 Claims**

1. A robot control system adapted to execute a task using a tool at a predetermined position upon correction of a tool position offset of a robot, the correction being based on information indicative of a position of a workpiece supported by a working surface, said system comprising:

sensor means for sensing the position of the workpiece as represented by a gripping direction vector in a fixed coordinate system of said sensor means, the fixed coordinate system defined by a Z-axis substantially normal to the working surface, an X-axis and a Y-axis; and

control means for calculating an amount of rotational



correction of the tool, with regard to the fixed coordinate system of said sensing means, from position information based on the gripping direction vector of the workpiece sensed by said sensing means.

4,899,096

INVOLUTE INTERPOLATION SPEED CONTROLLING METHOD

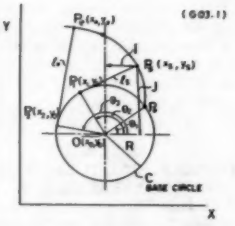
Hideaki Kawamura, Hachioji; Kentaro Fujihayashi, Musashino, and Toshiaki Otsuki, Hino, all of Japan, assignors to Fanuc LTC, Minamitsuru, Japan

Filed Feb. 7, 1989, Ser. No. 309,669

Claims priority, application Japan, Jun. 24, 1987, 62-157302

Int. Cl.[4] G05B *19/41, 19/415*

U.S. Cl. 318—573 **2 Claims**



1. In an involute interpolation speed controlling method for use in machining by a numerical control apparatus, an involute interpolation method for interpolating an involute curve comprising the steps of: instructing a rotational direction of the involute curve, coordinates of an end point, a center position of a base circle as viewed from a start point, a radius (R) of the base circle, and a speed;

obtaining coordinates (X_0, Y_0) of the center of the base circle of the involute curve, an angle ($\theta 2$) of the start point, an angle ($\theta 3$) of the end point and a curve start angle ($\theta 1$) on the basis of the instructions and coordinates (Xs, Ys) of the start point; and

with respect to an involute curve represented by

$$X=R\{\cos(\theta+\theta 1)+\theta\sin(\theta+\theta 1)+X_0$$

$$Y=R\{\sin(\theta+\theta 1)-\theta\cos(\theta+\theta 1)\}+Y_0$$

increasing θ in a range from $\theta=(\theta 2-\theta 1)$ to $\theta=(\theta 3-\theta 1)$ according to a relation defined by

$$\theta_{n+1}=\theta_n+K/(R\cdot\theta)$$

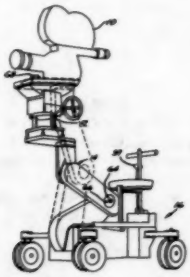
to thereby obtain corresponding points X_{n+1}, Y_{n+1} from the above equation.

4,899,097

MOTORIZED TANG DRIVE SYSTEM

Leonard T. Chapman, 13760 Chandler Blvd., Van Nuys, Calif. 91401

Filed Oct. 2, 1986, Ser. No. 914,490
Int. Cl.[4] B66F 3/34
U.S. Cl. 318—663 11 Claims



1. An electronic valve actuator system for controlling movement of an extendable boom arm actuated by a rotary control valve, comprising:

an actuator arranged to selectively operate the rotary control valve;

a rotator driver for selectively rotating said actuator; and

a controller for controlling actuator movement including a speed controller for controlling the speed at which said actuator actuates the rotary control valve,

a movement limiter for limiting the amount of actuation of said actuator, and

an actuator position sensor for detecting the position of the actuator, and

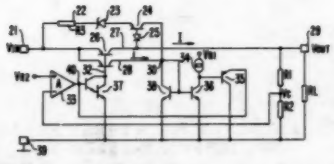
a boom position sensor for detecting the position of the boom arm.

4,899,098

LOW VOLTAGE DROP SERIES REGULATOR WITH OVERVOLTAGE AND OVERCURRENT PROTECTION

Roberto Gariboldi, Lacchiarella, Italy, assignor to SGS-Thomson Microelectronics S.p.A., Agrate Brinza, Italy

Filed Jun. 27, 1988, Ser. No. 211,925
Claims priority, application Italy, Jun. 25, 1987, 21039 A/87
Int. Cl.[4] G05F 1/569
U.S. Cl. 323—277 6 Claims



1. An integratable series voltage regulator having a low voltage drop, and having a power transistor protected against overvoltages and overcurrents, comprising:

an input terminal and an output terminal respectively connected to an emitter terminal and to a collector terminal of said power transistor;

a common terminal which is common to both said input and output terminals; a first means for providing a voltage proportional to an output voltage between said output terminal and common terminal;

a comparison and control circuit means having an output connected to a base terminal of said power transistor, a first input terminal connected to said first means and a second input terminal connected to a reference voltage, said reference voltage having a value such that a control current flows into said base of said power transistor in order to keep said output voltage between said output terminal and said common terminal at a substantially constant predetermined value;

a means for determining a collector current of said power transistor, comprising an auxiliary transistor having its base and emitter terminals respectively coupled to the base and emitter terminals of said power transistor, wherein a collector of said auxiliary transistor provides a first measuring current which is substantially proportional to said collector current of said power transistor;

a circuit means for determining the collector-emitter voltage of said power transistor and for generating a second measuring current at its output terminal when said collector-emitter voltage of said power transistor exceeds a preset value;

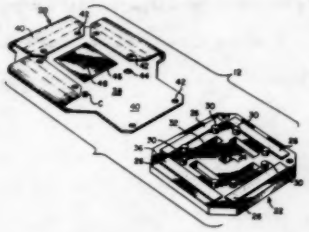
a processing circuit means having a summing input node, to which are connected said collector of said auxiliary transistor and said output terminal of said circuit means for determining the collector-emitter voltage of said power transistor, and an output terminal connected to a third input terminal of said comparison and control circuit means, said processing circuit means reducing a control current to said power transistor as a function of the algebraic sum of said first and second measuring currents, when said sum exceeds a limiting value of current, said limiting value being arranged such that said collector current and said collector-emitter voltage of said power transistor define a point within safe operating area of said power transistor.

4,899,099

FLEX DOT WAFER PROBE

David W. Mendenhall, Greenville, and Jay T. Goff, Cranston, both of R.I., assignors to Augat Inc., Attleboro, Mass.

Filed May 19, 1988, Ser. No. 196,048
Int. Cl.[4] G01R 1/02, 1/04
U.S. Cl. 324—158 F 19 Claims



12. For use in testing the electrical integrity of at least one integrated circuit formed on a semiconductor wafer, a probe test system including a flex dot wafer probe and external test equipment having signal transmitting elements disposed in a predetermined pattern for providing electrical test signals to test the electrical integrity and performance of each integrated circuit, and wherein each integrated circuit includes a predetermined pattern of contact elements adapted to receive the electrical test signals, said flex dot wafer probe comprising:

a probe board for interfacing with the external test equipment, said probe board including

interface contact pads having a predetermined pattern,

means for electrically interfacing with the signal transmitting elements of the external test equipment, and

means for electrically interconnecting said interface contact pads and said electrical interface means;

a wafer probe head configured to be forcibly urged into physical and electrical engagement with said probe board and to interface with each integrated circuit to be tested, said wafer probe head including

a resilient bendable film having a base plane and at least one tab extending from said base plane with the extremity thereof disposed approximately planar to said base plane,

a plurality of protrusions formed on each said at least one tab in a mirror-image pattern corresponding to said predetermined pattern of said interface contact pads of said probe board, said plurality of protrusions being forcibly urged into physical and electrical engagement with said interface contact pads in a nondeformable manner to provide electrical continuity therebetween for the electrical test signals,

a plurality of wafer contact pads formed on said base plane in a mirror-image pattern corresponding to said predetermined pattern of the contact elements of each integrated circuit to be tested, said wafer contact pads being forcibly urged into physical and electrical engagement with corresponding contact elements of each integrated circuit to be tested in a scrubbing and nondeformable manner to provide enhanced electrically continuity therebetween for the electrical test signals, and

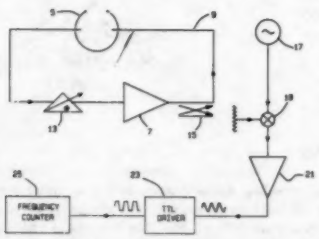
a plurality of coplanar line conductors formed on said base plane and said tabs to electrically interconnect corresponding ones of said plurality of protrusions and said plurality of wafer contact pads wherein the electrical test signals are transmitted from said interface contact pads to said plurality of protrusions, from said plurality of protrusions to said wafer contact pads via said plurality of coplanar line conductors and from said wafer contact pads to the contact elements of the integrated circuit to be tested to determine the electrical integrity and performance of the integrated circuit.

4,899,100

MICROWAVE MEASUREMENT OF THE MASS OF FROZEN HYDROGEN PELLETS

Vera Talanker, Golden, Colo., and Martin Greenwald, Belmont, Mass., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 1, 1988, Ser. No. 226,571
Int. Cl.[4] G01R *27/04*
U.S. Cl. 324—636 **9 Claims**



9. A method for determining the mass of a moving object of known composition comprised of the steps of:

driving a microwave transmission cavity contained in a microwave circuit at resonant frequency, said microwave transmission cavity being aligned so that the object passes through said microwave transmission cavity; and

comparing the resonant frequency of said microwave transmission cavity when the moving object is passing through said microwave transmission cavity with the resonant frequency of said microwave transmission cavity in the absence of the moving object;

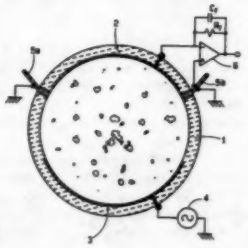
whereby the mass of the moving object can be determined.

4,899,101

ONLINE CAPACITIVE DENSITOMETER

Karl G. Porges, Evanston, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 21, 1988, Ser. No. 146,509
Int. Cl.[4] G01R *27/26*
U.S. Cl. 324—663 **11 Claims**



1. Apparatus for measuring fluid density comprising:

(a) conveyance means for conveyance of a fluid;

(b) electrode plates positioned in relation to said conveyance means so that the fluid passes between said electrode plates;

(c) means for measuring the electrical capacitance of said electrode plates whereby the density of the fluid can be measured;

(d) means for uniformizing the electrode field between the electrode plates and confining the electric field inside said conveyance means.

4,899,102

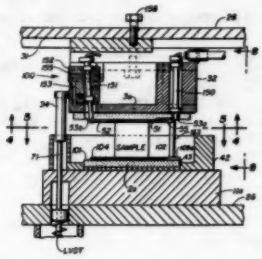
ELECTRODE SYSTEM FOR A PARALLEL PLATE DIELECTRIC ANALYZER

Kendall B. Hendrick, Landenberg, Pa., and John R. Reader, Jr., Newark, Del., assignors to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Division of Ser. No. 206,092, Jun. 13, 1988. This application Apr. 12, 1989, Ser. No. 337,131
Int. Cl.[4] G01R *27/26*
U.S. Cl. 324—663 **3 Claims**

1. An electrode system comprising a support means, a response electrode which has a ceramic substrate and is detach-

ably attached to said support means by mechanical means and an excitation electrode which has a ceramic substrate with a



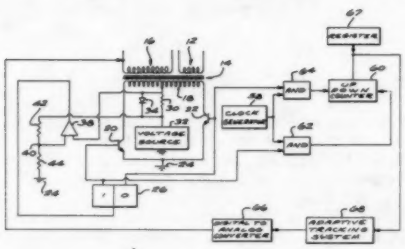
temperature sensor adhered to the surface of said ceramic substrate.

4,899,103

CURRENT METER

Henry S. Katzenstein, Pacific Palisades, Calif., assignor to Brooktree Corporation, San Diego, Calif.

Filed Jul. 16, 1987, Ser. No. 74,256
Int. Cl.[4] G01R *33/00, 19/00*
U.S. Cl. 324—99 D **74 Claims**



50. Apparatus for determining a variable electrical current, including,

a magnetizable member disposed in a closed loop,

a first winding magnetically coupled to the magnetizable member to receive a current variable in accordance with the variations in the variable electrical current and to produce in the magnetizable member a flux related to such current,

a second winding magnetically coupled to the magnetizable member to produce a flux in the magnetizable member in an opposite direction to that produced by the current in the first winding,

a third winding magnetically coupled to the magnetizable member, the third winding being center tapped,

bistable means having first and second stages of operation, one of the stages being connected between the center tap and one end terminal of the third winding and the other stage being connected between the center tap and the other end terminal of the third winding,

means including the bistable stage for alternately producing a flow of current to a particular magnitude in one direction between the center tap and one end terminal of the third winding and in an opposite direction between the center tap and the other end terminal of the third winding,

means responsive to the flow of current in the opposite directions in the third winding for producing a digital count in one direction of the time for the flow of such current in one direction to the particular magnitude and for producing a digital count in the opposite direction of the time for the flow of such current in the opposite direction to the particular magnitude, and

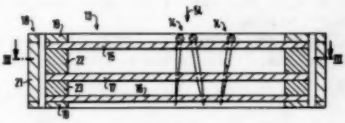
means responsive to the count in the digital counter in each cycle of operation of the bistable means for adjusting the polarity and magnitude of the current in the second winding to obtain the production by the second winding of flux nullifying in the magnetizable member the flux produced in the magnetizable member by the current in the first winding.

4,899,104

ADAPTER FOR A PRINTED CIRCUIT BOARD TESTING DEVICE

Martin Maelzer, Hagenburger Str. 26, D-3050 Wunstorf, Fed. Rep. of Germany; Rüdiger Dehmel, Wunstorf, Fed. Rep. of Germany; Hans-Hermann Higgen, Stadthagen, Fed. Rep. of Germany, and Andreas Gülzow, Springe, Fed. Rep. of Germany, assignors to Erich Luther and Martin Maelzer, both of Wunstorf, Fed. Rep. of Germany

Filed Nov. 16, 1987, Ser. No. 121,039
Claims priority, application Fed. Rep. of Germany, Nov. 18, 1986, 3639359; Oct. 29, 1987, 3736689
Int. Cl.[4] G01R *1/02, 1/04*
U.S. Cl. 324—158 F **26 Claims**



1. An adapter for a printed circuit board testing device, by means of which test contacts located on a grid can be connected to test points of a printed circuit board to be tested that are located on and/or off grid, said adapter comprising a test pin guide structure formed with guide holes arranged on the grid on one side of said structure and at least partially out of said grid on the other side of the structure, test pins received in said guide holes in the adapter, at least one of said pins being formed with a pointed contact section that projects from the adapter toward a respective contact point of the printed circuit board, said one pin test pin having an adjacent guidance section that is guided in an associated guide hole of the test pin guide structure, the cross-section of the guidance section of said one pin being greater than that of its respective pointed contacting section and being reduced along its length towards the contacting section, and the cross-section of the associated guide hole in said test pin guide structure being correspondingly reduced to permit said test pins to extend through the guide structure at converging inclinations so that respective contact points of adjacent test pins contact closely positioned test points on said printed circuit board.

4,899,105

METHOD OF TESTING ELECTRICAL CHARACTERISTICS OF LCD WITH PROBE DEVICE

Shuji Akiyama, Kofu, Japan, assignor to Tokyo Electron Limited, Tokyo, Japan

Filed Sep. 2, 1988, Ser. No. 239,677
Claims priority, application Japan, Sep. 2, 1987, 62-219639
Int. Cl.[4] G01R *31/26*
U.S. Cl. 324—158 F **10 Claims**

4. A method of testing electrical characteristics of an object with a probe device, said method comprising the steps of:

(a) placing an object to be tested on a stage inside the probe device;

(b) setting a light output end of a light supplying means to oppose the object;

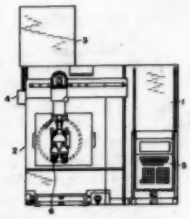
(c) guiding light from a light source unit outside the probe

device to a light incident end of the light supplying means; and

(d) testing the electrical characteristics of the object while light is kept supplied from the light output end of the light supplying means,

wherein:

(e) an incident end portion of the light supplying means is



located between the probe device and the light source unit in a flexed state; and

(f) the light supplying means is moved in response to movement of the stage due to flexure of the light supplying means, wherein:

(g) the light output end of the light supplying means is supported inside the stage so as to oppose a support surface of the stage.

4,899,106

PERSONALITY BOARD

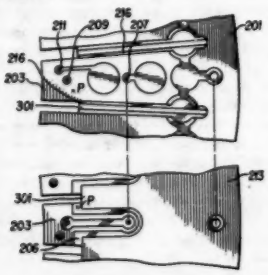
Mitsuhiro Ogura, Kunitachi, Japan, assignor to Hewlett Packard Company, Palo Alto, Calif.

Filed Jul. 28, 1988, Ser. No. 225,492

Claims priority, application Japan, Aug. 18, 1987, 62-125439[U]

Int. Cl.[4] G01R *31/02, 1/06*

U.S. Cl. 324—158 F **5 Claims**



1. A personality board for use with a semiconductor wafer test set interposed between a test set test head and a probe card, said personality board comprising:

a plurality of electrically conductive pad groups disposed on a circuit board of insulating material, each of said pad groups corresponding to a terminal group of said test head, said terminal group including at least a first terminal, a second terminal and a third terminal;

each pad group disposed on said circuit board in spaced-apart relationship with each of the other pad groups, each pad group separated from adjacent pad groups by a slit in said insulating material;

an electrically conductive material disposed on said circuit board in a predetermined pattern forming a first guard pattern surrounding and enclosing said plurality of pad groups, said first guard pattern electrically connected to the pad in each of said plurality of pad groups corresponding to said third terminal; and

each of the pads in each group corresponding to said first terminal and said second terminal, respectively, being electrically separated from each other on said circuit board.

4,899,107

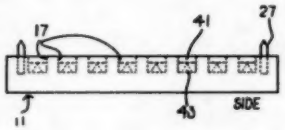
DISCRETE DIE BURN-IN FOR NONPACKAGED DIE

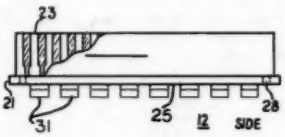
Tim J. Corbett, and Alan G. Wood, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Sep. 30, 1988, Ser. No. 252,606

Int. Cl.[4] G01R *31/28, 31/02*

U.S. Cl. 324—158 F **16 Claims**





9. Discrete testing apparatus for testing a plurality of semiconductor devices in unpackaged die form, for performing electrical tests in a manner similar to that accomplished with discrete packaged semiconductor devices, comprising:

(a) a first plate;

(b) a plurality of die-receiving cavities in the first plate;

(c) a second plate having a plurality of die contacting conductors extending therefrom;

(d) alignment means for aligning the first plate with the second plate;

(e) the die contacting conductors being positioned on the second plate so that, when the first plate and the second plate are aligned by the alignment means and the dice are positioned in the die-receiving cavities, the die contacting conductors are in alignment with contact locations on the dice;

(f) connector terminals in an electrical communication with the die contacting conductors, the connector terminals being mounted to the second plate; and

(g) the die receiving cavities having biased platforms therein, the biased platforms extending biasing forces against the dice which are sufficiently uniform to cause the dice to establish contact with the respective die contacting conductors on the second plate.

4,899,108

HIGH FREQUENCY COIL

Michiru Fujita, and Masao Higuchi, Kawasaki, both of Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Aug. 17, 1988, Ser. No. 235,313

Claims priority, application Japan, Aug. 21, 1987, 62-207635; Aug. 21, 1987, 62-207636; Dec. 25, 1987, 62-329133

Int. Cl.[4] G01R *33/20*

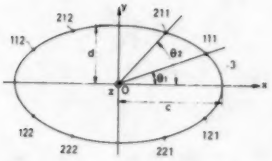
U.S. Cl. 324—318 **15 Claims**

1. A high frequency coil comprising:

a plurality of unit coils each of which has a first elementary

coil including two line sections in parallel with each other and a second elementary coil confronting said first elementary coil and including two line sections in parallel with said two line sections of said first elementary coil;

all of said line sections included in said plurality of unit coils being provided on an outer peripheral surface of a common elliptic cylinder and having their longitudinal centers substantially on one plane which intersects perpendicularly the center axis of said elliptic cylinder;



said four line sections included in each unit coil occupying respective corners of a rectangle on said plane, each of said rectangles formed of said unit coils including a common central point and corresponding sides of each of said rectangles being disposed in parallel with each other; and

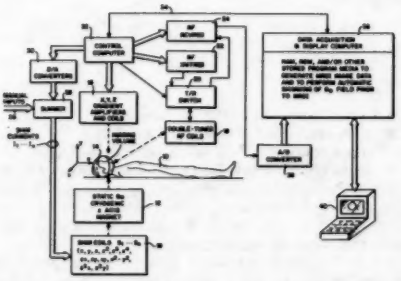
said line sections in each said unit coil being respectively electrically connected so as to generate a magnetic flux in the same direction at said common central point.

4,899,109

METHOD AND APPARATUS FOR AUTOMATED MAGNETIC FIELD SHIMMING IN MAGNETIC RESONANCE SPECTROSCOPIC IMAGING

James S. Tropp, Berkeley; Kevin A. Derby, S. San Francisco, and K. Christine Hawryszko, Millbrae, all of Calif., assignors to Diasonics Inc., South San Francisco, Calif.

Filed Aug. 17, 1988, Ser. No. 233,021
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—320 **47 Claims**



1. A method for adjusting currents in plural magnetic shim coils in an MRI/MRSI system comprising the steps of:

(a) mapping an existing magnetic field distribution;

(b) machine calculating an adjusted set of currents for actual shim coils to improve uniformity of field distribution while also using in such calculation an assumed uniformly distributed fictitious pseudo shim coil which does not actually exist thereby permitting uniform offset adjustments to be included in the calculations; and

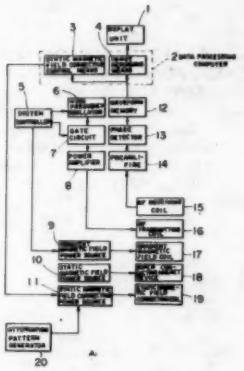
(c) applying said adjusted set of currents to the actual shim coils.

4,899,110

MAGNETIC RESONANCE IMAGING APPARATUS WITH STABILIZED MAGNETIC FIELD

Hiroshi Furukawa, Otawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 22, 1988, Ser. No. 274,577
Claims priority, application Japan, Nov. 25, 1987, 62-295362
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—320 **10 Claims**



5. A static magnetic field stabilizer for a magnetic resonance apparatus, said static magnetic field stabilizer comprising:

a memory storing attenuation pattern information, said attenuation pattern information representing decay of a first magnetic field, generated by a superconducting magnet, over time; and

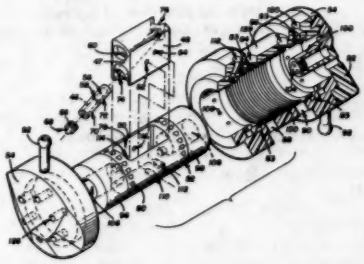
a correcting coil generating a second magnetic field superimposed on said first magnetic field, said second magnetic field compensating for decay of said first magnetic field such that decay of a net magnetic field experienced by a subject in said magnetic resonance apparatus is lessened.

4,899,111

PROBE FOR HIGH RESOLUTION NMR WITH SAMPLE REORIENTATION

Alexander Pines, Berkeley, Calif., and Ago Samoson, Tallinn, U.S.S.R., assignors to The Regents of the University of California, Oakland, Calif.

Filed Aug. 3, 1988, Ser. No. 227,729
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—321 **16 Claims**



1. An apparatus for measuring the NMR spectra of a sample, said apparatus comprising:

means for holding said sample in a magnetic field, the orientation of said sample being specified by a set of angles, Ω, said set of angles being measured with reference to the direction of said magnetic field; and

orientation means for causing the orientation of said sample to change relative to said magnetic field, the orientation of said sample at time t being equal to Ω(t), wherein the time average of each of two different sets of spherical harmonic functions, Y_{lm}, is substantially zero over the values Ω(t) realized during the time of said NMR measurement.

4,899,112

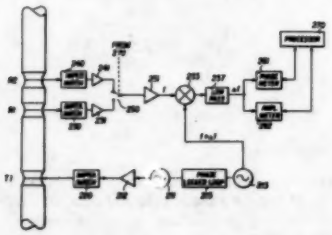
WELL LOGGING APPARATUS AND METHOD FOR DETERMINING FORMATION RESISTIVITY AT A SHALLOW AND A DEEP DEPTH

Brian Clark; Jacques Jundt; Martin Laling, all of Missouri City, and Michael O. Rosa, Needville, all of Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.

Filed Oct. 30, 1987, Ser. No. 115,503

Int. Cl.[4] G01V *3/30, 3/18*

U.S. Cl. 324—338 **67 Claims**



1. Apparatus for determining the resistivity of earth formations surrounding a borehole, comprising;

means for generating electromagnetic wave energy at a first location in the borehole;

means for receiving electromagnetic wave energy at second and third locations in the borehole, said second and third locations being successively spaced longitudinally in the borehole from said first location;

means for detecting the phase shift between electromagnetic energy received at said second and third locations in the borehole;

means for detecting the attenuation between electromagnetic energy received at said second and third locations in the borehole;

means for determining, as a function of the detected phase shift, the resistivity of formations at a relatively shallow depth of investigation around said second and third locations; and

means for determining, as a function of the detected attenuation, the resistivity of formations at a relatively deep depth of investigation around said second and third locations.

4,899,113

SWITCHING HELIX POWER SUPPLY FOR A TWT

Wolter Bulkema, Borne, Netherlands, assignor to Hollandse Signaalapparaten B.V., Hengelo, Netherlands

Filed Jun. 15, 1988, Ser. No. 209,451

Claims priority, application Netherlands, Jun. 29, 1987, 8701515

Int. Cl.[4] H03J *19/82, 25/34*

U.S. Cl. 328—258 **7 Claims**

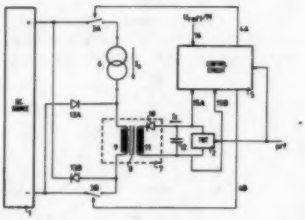
1. A switching power supply including a dc voltage source for generating a dc voltage for a pulsating load comprising:

buffer means for powering said load;

converter means having a primary and a secondary, said secondary connected to the buffer means;

a constant current source connected to the dc voltage source;

switch means connected to said constant current source and the primary of said converter means; and



load responsive control means connected to the switch means for selectively connecting said constant current source to the primary of the converter means in response to said pulsating load.

4,899,114

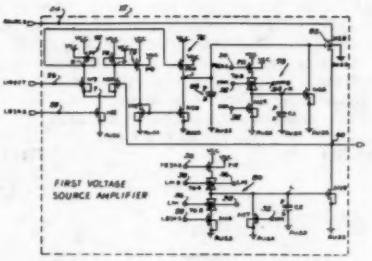
VOLTAGE SOURCE AMPLIFIER FOR USE IN A PSEUDOTERNARY CODE TRANSMITTER

Geoffrey E. Berhmer, and Joe W. Peterson, both of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Division of Ser. No. 146,988, Jan. 22, 1988, Pat. No. 4,829,541. This application Jan. 23, 1989, Ser. No. 299,908

Int. Cl.[4] H03F *3/45*

U.S. Cl. 330—253 **3 Claims**



1. A voltage source amplifier comprising:

differential amplifying means (72) formed of a first N-channel input transistor (N9) and a second N-channel input transistor (N10), a first P-channel load transistor (P7), a second P-channel load transistor (P8), and a third N-channel current source transistor (N11) for comparing an output voltage at an output node with a reference voltage to generate a differentially amplified signal;

said first N-channel transistor (N9) having its drain connected to the drain and gate of said first load transistor (P7), its source connected to the source of said second input transistor (N10), and its gate connected to receive the reference voltage;

said second N-channel transistor (N10) having its drain connected to the drain and gate of said second load transistor (P8), and its gate connected to receive the output voltage;

said third N-channel transistor (N11) having its drain connected to the common sources of said first and second N-channel transistors (N9, N10), its source connected to a ground potential (VSS) and its gate connected to a bias voltage;

said first and second P-channel transistors (P7, P8) having their sources connected to a supply potential (VCC);

a first gain stage circuit (74) formed of a third P-channel drive transistor (P9) and a fourth N-channel load transistor (N12), said third P-channel transistor (P9) having its source connected to the supply potential (VCC), its drain connected to the drain of said fourth N-channel transistor (N12), and its gate connected to the gate and drain of said second P-channel transistor (P8), said fourth N-channel transistor (N12) having its gate and drain connected together and its source connected to the ground potential (VSS);

a second gain stage circuit (76) formed of a fourth P-channel drive transistor (P10) and a fifth N-channel load transistor (N13), said fourth P-channel transistor (P10) having its source connected to the supply potential (VCC), its drain connected to the drain of said fifth N-channel transistor (N13), and its gate connected to the gate and drain of said first P-channel transistor (P7), said fifth N-channel transistor (N13) having its gate connected to the gate and drain of fourth N-channel transistor (N12) and its source connected to the ground potential (VSS);

a push-pull output stage (82) formed of an N-channel output sourcing transistor (N18) and an N-channel output sinking transistor (N19), said output sourcing transistor (N18) having its drain connected to receive a drive current, its source connected to the drain of said output sinking transistor (N19) and to the output node, and its gate connected to the drain of said fourth P-channel drive transistor (P10) and a first charge control signal, said output sinking transistor (N19) having its gate connected to a second charge control signal and its source connected to the ground potential (VSS); and

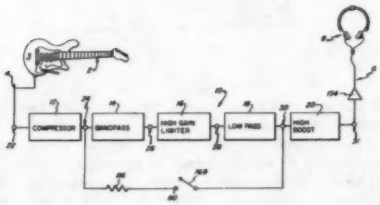
first linear charging means (78) for generating said first charge control signal and being formed of a P-channel charging transistor (P11), a transmission gate (TG3), a pull-down transistor (N14), a capacitor (C1), and a switching transistor (N15).

4,899,115

SYSTEM FOR CONTROLLING THE DYNAMIC RANGE OF ELECTRIC MUSICAL INSTRUMENTS

David E. Christian, Danbury, Conn., assignor to CB Labs, Inc., Bridgeport, Conn.

Filed Nov. 18, 1988, Ser. No. 274,443
Int. Cl.[4] H03F 3/191
U.S. Cl. 330—302 **32 Claims**



1. A signal control circuit for an electrical musical instrument comprising:

(a) an amplifier circuit having a noninverting input port for receiving an electrical musical instrument input signal to be controlled, said input signal having an amplitude range varying between minimum and maximum values, an output port for supplying a controlled output signal, and an inverting input port for receiving a feedback signal from said output port for controlling amplifier gain;

(b) input compressing circuit means operatively coupled to said noninverting input port for compressing the amplitude of the input signal applied to said input port to a compressed input signal having an amplitude no greater than about a predetermined maximum level, said input compressing circuit means also for converting said compressed signal to a substantially nonlinear function of said input signal to preferentially emphasize desired harmonic content of said compressed signal; and

(c) feedback circuit means operatively coupling said output port to said inverting input port for feeding back a portion of said output signal as a feedback signal, said feedback circuit means including feedback signal compressing means for compressing said feedback signal to a compressed feedback signal having an amplitude no greater than a preselected maximum value, said feedback circuit means also for reducing the gain of said amplifier as a nonlinear function of said output signal as said output signal increases,

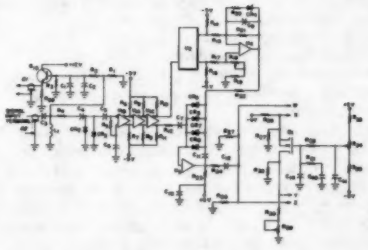
whereby said output signal has preferentially emphasized harmonic content and has an amplitude compressed within a selected range relatively independently of the range of said input signal.

4,899,116

APPARATUS AND METHOD FOR PARALLELING POWER FIELD EFFECT TRANSISTORS IN HIGH FREQUENCY AMPLIFIERS

Don P. Roehrs, New River, and Helge O. Granberg, Phoenix, both of Ariz., assignors to Signal One Corporation, Phoenix, Ariz.

Continuation of Ser. No. 58,592, May 26, 1987, Pat. No. 4,733,194, which is a continuation of Ser. No. 701,492, Feb. 16, 1985, abandoned. This application Mar. 17, 1988, Ser. No. 169,401
Int. Cl.[4] H03F 3/217
U.S. Cl. 330—251 **19 Claims**



1. Apparatus for providing a constant duty cycle rectangular wave signal in response to an input sine wave signal over the 1.6 MHz to 30 MHz frequency range and above, comprising:

wave shaping means for converting said input sine wave signal into a square wave signal, said square wave signal having a same frequency as said input sine wave signal;

voltage means coupled to said wave shaping means for providing a voltage signal having an amplitude determined by said square wave signal frequency;

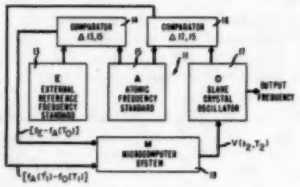
integrator circuit means for providing a triangular wave signal in response to said square wave signal, triangular wave signal having a slope determined by said voltage signal amplitude; and

comparator means for controlling a duty cycle of said rectangular wave signal in response to said triangular wave signal.

4,899,117
HIGH ACCURACY FREQUENCY STANDARD AND CLOCK SYSTEM

John R. Vig, Colts Neck, N.Y., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 24, 1987, Ser. No. 138,790
Int. Cl.[4] H03L 7/26
U.S. Cl. 331—3 2 Claims



1. A device comprising, in combination:
an atomic frequency standard as a reference frequency source;
a temperature compensated slave crystal oscillator having voltage-controlled frequency adjustment circuitry responsive to control by command signals from a microcomputer;
a microcomputer in circuit with said atomic frequency standard and with said slave crystal oscillator, said microcomputer being programmed to command said adjustment circuitry to change the frequency of said slave crystal oscillator in accordance with periodic signals from said microcomputer developed in accordance with corresponding comparison signals produced by periodic comparisons of signals from said slave crystal oscillator and signals from said atomic frequency source; and
said microcomputer contains temperature and aging data for both said atomic frequency standard and said crystal oscillator and said microcomputer is further programmed to command said voltage-controlled frequency adjustment circuitry to vary the frequency of said crystal oscillator to bring said crystal oscillator into syntonization with an external frequency source.

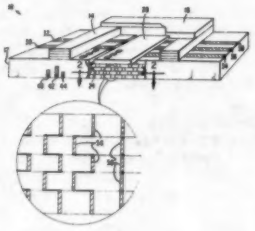
2. A device comprising, in combination:
an atomic frequency standard;
a temperature compensated crystal oscillator having pulse control circuitry responsive to pulse deletion signals from a microcomputer;
a microcomputer compensated digital clock in circuit with said atomic frequency standard and with said crystal oscillator, said microcomputer compensated digital clock being programmed to send pulse deletion signals to said pulse control circuitry in accordance with periodic signals produced by comparisons of pulses from said crystal oscillator with pulses from said atomic frequency standard.

4,899,118
LOW TEMPERATURE COFIRED CERAMIC PACKAGES FOR MICROWAVE AND MILLIMETER WAVE GALLIUM ARSENIDE INTEGRATED CIRCUITS

Paul W. Polinski, Sr., Dana Point, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 27, 1988, Ser. No. 289,862
Int. Cl.[4] H01P 5/00
U.S. Cl. 333—246 15 Claims

13. A hybrid microcircuit package comprising:
a low temperature cofired layered substrate having buried passive components disposed between selected layers of the substrate and having a plurality of interconnected vias extending though the substrate to provide electrical interconnection to each of the buried passive components;
at least one cavity formed in the top surface of the substrate;
a plurality of conductor metallization paths disposed on selected surfaces of the substrate and extending from the outside edge of the substrate to the edge of the cavity;

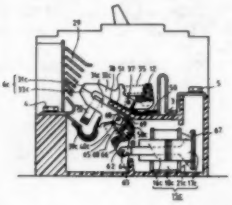


a low temperature cofired sidewall disposed on the top surface of the substrate surrounding the cavity;
a cover attachable to the top surface of the sidewall for enclosing the package.

4,899,119
CIRCUIT BREAKING APPARATUS WITH REMOTE CONTROLLED OPENING AND CLOSING OF ITS CIRCUITS

Elie Belbel, Epinay Sur Seine; Christian Blanchard, Nanterre; André Haury, Le Raincy, and Michel Lauraire, Courbevoie, all of France, assignors to La Telemecanique Electrique, France

Continuation of Ser. No. 135,518, Dec. 18, 1987, abandoned, which is a continuation of Ser. No. 798,666, Nov. 15, 1985, abandoned. This application Jun. 28, 1989, Ser. No. 373,654
Claims priority, application France, Nov. 16, 1984, 8417505
Int. Cl.[4] H01H 75/00
U.S. Cl. 335—14 7 Claims



1. A circuit breaking apparatus, in particular a multiphase circuit breaker comprising:
i- a common quick trip mechanism which may be set and released by means of a local manual control member.
ii- at least a power circuit comprising between two terminals a switching having a first mobile contact connected to the mechanism so as to be actuated thereby between closed and opened positions, and a second mobile contact carried by a first pivoting lever so as to effect with respect to the first mobile contact, retracting or advancing movements between at least a retracted position, wherein the second mobile contact is spaced from the first mobile contact, and an advanced position, wherein the second mobile contact bears on the first mobile contact with the said first mobile contact is in its closed position,
iii- detectors which react to overcurrent passing through said power circuit by causing the tripping of said mechanism and consequently the automatic opening of the switch, and
iv- an electromagnet which is associated with the apparatus

for causing remote controlled opening of the switch not causing the tripping of said mechanism, said electromagnet having an armature which is connected to said first pivoting lever through transmission means including an insulating pivoting support pivoted about a fixed axis and having a first arm on which is pivoted the said first pivoting lever and a second arm which is connected to the armature through articulation means, and a spring disposed under compression between the first pivoting leer and a bearing surface of the insulating pivoting support.

4,899,120

ELECTROMAGNETIC CONTACTOR

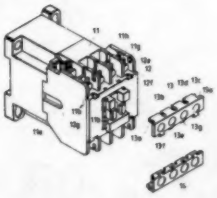
Shigeaki Ohtake; Kuniyuki Kogawa, and Takato Hirota, all of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Jul. 13, 1988, Ser. No. 220,035

Claims priority, application Japan, Jul. 24, 1987, 62-113394[U]

Int. Cl.[4] H01H *67/02*

U.S. Cl. 335—132 **10 Claims**



1. An electromagnetic contactor comprising:

a contactor body;

a plurality of fixed contacts, each of said fixed contacts having a terminal end and a contact end;

a plurality of movable contacts, each of said movable contacts being associated with a different one of said fixed contacts for making selective electrical connection at a contact point with said contact end of said associated fixed contact; and

selectively removable arc-extinction cover means for preventing electrical arcing between said contact point and said terminal end of said fixed contacts, said arc-extinction cover means being detachably secured to said contactor body, said movable contacts making said selective electrical connection when said cover means is attached to and detached from said contactor body, said cover means being removable to allow selective inspection, cleaning, and removal of each of said movable contacts.

4,899,121

ALTERNATING CURRENT ELECTROMAGNET

Edwin J. Boothroyd, Asheville, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 1, 1989, Ser. No. 345,873

Int. Cl.[4] H01F *7/10*

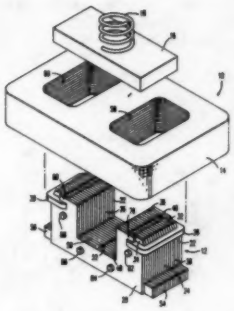
U.S. Cl. 335—245 **11 Claims**

1. An alternating current electromagnet with a magnetic assembly, said magnetic assembly comprising:

a circuitous shading coil having a first portion, second and third portions each adjacent to said first portion, and a fourth portion adjacent to said second and third portions,

magnetic core means having a pole face and two generally opposed parallel sides with an open channel formed in said pole face and extending from one said parallel side to the other said parallel side for receiving said first portion of said shading coil with said adjacent second portion extending along said one parallel side of said magnetic core means in a lateral direction and said third portion extending along said other parallel side of said magnetic core means in a lateral direction,

sideplate means arranged along each of said two opposed parallel sides of said magnetic core means and attached to said core means,



said each sideplate means having slot means with a lateral opening for receiving a different one of said second and third portions of said shading coil, and extension means located adjacent to said slot means and extending across said open channel along said opposed parallel sides of said magnetic core means in a manner to retain said shading coil in said open channel of said magnetic core means.

4,899,122

TRANSFORMER, CHOKE AND THE LIKE

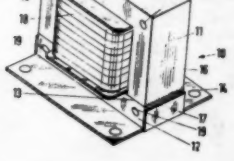
Friedrich-Wilhelm Sommer, Soest, Fed. Rep. of Germany, assignor to ABB CEAG Licht- und Stromversorgungstechnik GmbH, Soest, Fed. Rep. of Germany

Filed Dec. 5, 1988, Ser. No. 280,167

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1987, 8716135[U]

Int. Cl.[4] H01F *27/26*

U.S. Cl. 336—65 **4 Claims**



1. Transformer, choke or the like, and fastening assembly comprising a magnetic core assembled from two lamination packets formed of laminations layered in a given direction, said lamination packets having outer contacting surfaces defining a partition line therebetween, a weld seam transverse to said given direction fastening said contacting surfaces to one another and overlapping said partition line, and a fastening element for fastening the transformer, choke or the like to a floor or a wall, upright tabs formed on said fastening element, said upright tabs having free edges alongside said partition line being partially welded with said weld seam.

4,899,123

HIGH CURRENT CAPACITY SUB-MINIATURE FUSE

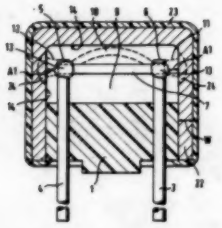
Norbert Asdollahi, Witten; Karl Poerschke, Sprockhövel; Klaus Stärk, Witten, and Claus Friedrich, Geveisberg, all of Fed. Rep. of Germany, assignors to Wickmann-Werke GmbH, Witten, Fed. Rep. of Germany

Filed Dec. 15, 1988, Ser. No. 284,498

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1987, 3742532; Sep. 26, 1988, 8812144

Int. Cl.[4] H01H *85/38*

U.S. Cl. 337—273 **19 Claims**



1. A fuse having a sealed chamber which is formed by a plastic base, a cap, two contacts which traverse said base, a fusible wire which melts under an over-current condition and a metal surface within said chamber for receiving heat during quenching of an arc which is generated after said fusible wire has been interrupted by fusing, the improvement comprising:

forming and positioning said metal surface relative to said fusible wire and said contacts in such a way that the arc jumps onto said metal surface and is thus quenched.

4,899,124

THERMALLY CONTROLLED ELECTRIC SWITCH

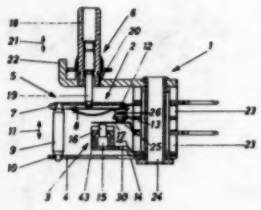
Walter Hollweck, Heroldsberg, Fed. Rep. of Germany, assignor to Thermostat-und Schaltgeraetebau GmbH & Co. KG, Bad Kissingen, Fed. Rep. of Germany

Filed Oct. 18, 1988, Ser. No. 259,275

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1987, 3735334

Int. Cl.[4] H01H *37/02*

U.S. Cl. 337—299 **25 Claims**



1. In a thermally controlled electrical switching arrangement for limiting the temperature of a heated or heating element, said arrangement being of the type having

a temperature controller comprising

a bimetallic strip, and

a snap-action switch actuated by said bimetallic strip and having a movable contact and a contact spring, wherein a dead center position of said contact spring is displaceable by a manually operable setting device in order to influence the control point, and

a temperature limiter constructed as a melting metal fuse having

a fusible element,

a pressure element and

at least one switching contact member having a fixed contact and a movable contact maintained in closed position by the pressure element as long as the limiter has not respondeu,

the improvement wherein said fixed contact of said limiter has respectively opposite first and second contact faces, wherein said movable contact of said limiter as influenced by said pressure element is in biased engagement with said first contact face of said fixed contact and wherein said movable contact of said temperature controller as influenced by said contact spring is in biased engagement with said second contact face of said fixed contact.

4,899,125

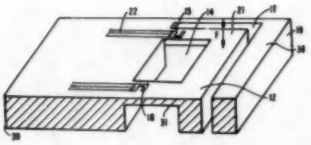
CANTILEVER BEAM TRANSDUCERS AND METHODS OF FABRICATION

Anthony D. Kurtz, Teaneck, N.J., assignor to Kulite Semiconductor Products, Inc., Leonia, N.J.

Filed Jul. 24, 1987, Ser. No. 82,407

Int. Cl.[4] G01L *1/22*

U.S. Cl. 338—2 **21 Claims**



1. In a cantilever beam transducer of the type employing a deflectable beam secured at one end to permit deflection at an unsecured opposite end, said beam being a relatively planar rectangular member and having a top and a bottom surface, the combination therewith comprising:

a rectangular aperture extending through said beam from said top and said bottom surface with said aperture forming thinned beam sections on either side of said aperture and piezoresistive bridge arrays mounted on said beam upon said thinned sections and located on said top surface of said beam whereby there is an array on each side of said aperture on said top surface.

4,899,126

THICK FILM RESISTOR TYPE PRINTED CIRCUIT BOARD

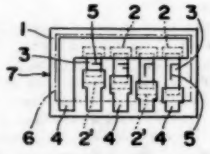
Takeharu Yamada, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 4, 1989, Ser. No. 293,416

Claims priority, application Japan, Mar. 7, 1988, 63-30869[U]

Int. Cl.[4] H01C *1/012*

U.S. Cl. 338—309 **6 Claims**

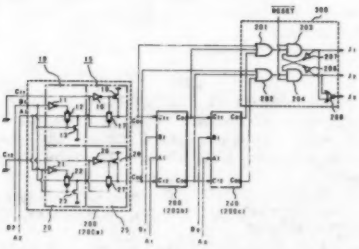


1. A thick film resistor type printed circuit board comprising:

an insulating substrate;

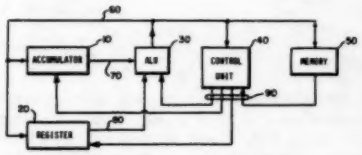
a plurality of pairs of terminal electrode layers made of silver, which are formed on said insulating substrate;
a plurality of resistor layers which are formed on said terminal electrode layers so as to connect the pairs of said terminal electrode layers, respectively;
a plurality of wiring conductive layers made of copper, which are, respectively, connected to predetermined ones of said terminal electrode layers so as to coat said terminal electrode layers; and
a protective layer for covering at least a portion of said insulating substrate, in which portion said terminal electrode layers and said resistor layers are formed.

4,899,127
SIZE COMPARING CIRCUIT
Hiroyuki Kawai, and Kazuya Ishihara, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan
Filed Sep. 8, 1988, Ser. No. 242,006
Claims priority, application Japan, Jan. 21, 1988, 63-11207
Int. Cl.[4] G06F 7/02
U.S. Cl. 340—146.2 **3 Claims**



1. A size comparing circuit for comparing sizes between a first n-bit binary data and a second n-bit binary data, comprising;
n number of one bit judging means each of which has
as a first and second data input corresponding to a bit of said first and second binary data;
a logical "0" signal as a first and second external input signal to the judging means corresponding to the Most Significant Bit,
each of said judging means having a first and second external output signals, which are used as the first and second external input signal for the next less significant bits means; and has
a first comparing means outputting "1" in the case where said first data is "1" and said second data is "0", and outputting "0", and outputting "0" in the other cases;
a second comparing means outputting "1" in the case where said second data is "1" and said first data is "0" in the other cases;
a first compared result outputting means taking an output signal of said first comparing means when the first external input signal is "0", and taking a signal "1" when the first external input signal is "1" respectively as an external output signal; and
a second compared result outputting means taking an output signal of said second comparing means when the second external input signal is "0", and taking a signal "1" when the second external input signal is "1" respectively as an external output signal; and
a judging means which has
a first gate outputting "1" when any one of outputs of said first compared result outputting means of said respective one-bit judging means is "1";
a second gate outputting "1" when any one of outputs of said second compared result outputting means of said respective one-bit judging means is "1"; and
a judgement signal outputting means outputting a first judgement signal as a result of judgment that the first binary data is larger that the second binary data when said both gate outputs are inputted and only said first gate output is "1", outputting a second judgment signal as result of judgment that the second binary data is larger than the first binary data when only said second gate output is "1", and outputting a third judgement signal as a result of judgment that the both binary data are equal when said both gate outputs are "0".

4,899,128
METHOD AND APPARATUS FOR COMPARING STRINGS USING HASH VALUES
Ehud Y. Shapiro, Rehovot, Israel, assignor to Yeda Research and Development Co., Ltd., Rehovot, Israel
Filed Dec. 11, 1985, Ser. No. 807,552
Int. Cl.[4] G06F 7/02
U.S. Cl. 340—146.2 **15 Claims**



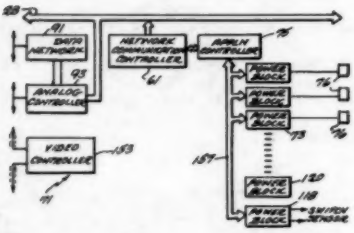
9. Apparatus for comparing strings of data generated simultaneously by two or more computer programs running in parallel comprising:
means for generating a hash code for each string, each also string comprising other information,
means for storing each string and hash code generated therefor,
means for generating a unique pointer for each different string stored in said storing means,
first and second registers,
an arithmetic logic unit, and
means of comparing a pair of said strings comprising:
means for loading the pointers for such strings into said first and second registers,
means for comparing the contents of said first and second registers,
means for loading the hash codes into said first and second registers if the pointers are different as determined by said comparison,
means for comparing the contents of said first and second registers, and
means for comparing other information in each said string if the hash codes are the same as determined by said comparison to determine if the strings are the same.

4,899,129
AUTOMATED APPLIANCE AND ENERGY DISTRIBUTION CONTROL SYSTEM
David J. MacFadyen, Derwood, Md.; Robert G. Edwards, Oak Ridge, Tenn.; Kenneth P. Wacks, stoneham, and Daniel J. Foley, Chelmsford, both of Mass., assignors to Smart House Limited Partnership, Upper Marlboro, Md.
Division of Ser. No. 126,794, Dec. 1, 1987. This application Nov. 8, 1988, Ser. No. 268,868
Int. Cl.[4] H04M 11/04
U.S. Cl. 340—310 R **2 Claims**

1. An automated system apparatus for providing AC energy from an energy source and communications services within a house to appliances capable of receiving said AC energy and appliance digital data and generating appliance digital data, comprising:
energy distribution means for supplying said AC energy

from said energy source to appliances throughout the house;

appliance coordination data network means for communicating appliance digital data throughout the house, said appliance coordination data network means including a plurality of outlet control power block means responsive to a power desired appliance digital data signal for applying said AC energy from said energy distribution means to said appliances throughout the house; and



a plurality of common outlet means for connectable attachment of one of said appliances, each common outlet means connected to one of said outlet control power block means and capable of receiving said AC energy only after attachment of one of said appliances and after said outlet control power block means receives said power desired appliance digital data signal generated by said appliance.

4,899,130

ELECTRIC DESIRED-VALVE INDICATOR

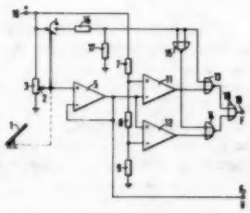
Rainer Rossberg, Schwalbach, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 20, 1987, Ser. No. 123,117

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1986, 3643946

Int. Cl.[4] B60G *1/00*

U.S. Cl. 340—438 **5 Claims**



4. An electric desired-value transmitter for automotive vehicles, particularly for a vehicle having an electric gas pedal, the transmitter comprising

an actuating element and a potentiometer, a wiper of the potentiometer being mechanically connected to the actuating element, the wiper serving as an output terminal of the potentiometer and providing an output voltage of the transmitter;

a switch mechanically coupled to the actuating element, a state of the switch changing to an actuation state as a function of position of the actuating element;

a comparison device connected to the switch, and providing an output signal dependent on the switch state;

a reference circuit coupled to the comparison device and providing a first comparison voltage and a second comparison voltage different from said first comparison voltage; and wherein

the output voltage of the desired-value transmitter and said first and said second comparison voltages are fed to the comparison device, the second comparison voltage being larger than the first comparison voltage, the value of said transmitter output voltage lying between values of said first and said second comparison voltages during absence of a failure in an operating condition of said transmitter; and

said comparison device includes means for comparing said transmitter output voltage to said first and said second comparison voltages, said comparing means outputting a plurality of comparison signals designating a relative magnitude and said transmitter output voltage to said comparison voltages, said comparison device further including a logic circuit which is connected to said switch and evaluates logical state of the comparison signals in accordance with a state of said switch to output the output signal of the comparison device, the output signal of the comparison device serving as an error signal designating the presence of a failure when the output voltage of said transmitter lies outside a range of voltage defined by said first and said second comparison voltages and by a state of said switch.

4,899,131

LOCAL CONTROL SYSTEM FOR DOMESTIC APPLIANCES AND ALARM DEVICES

Sven T. Wilk, Vintrie, and John G. Olsson, Bjärred, both of Sweden, assignors to Aktiebologet Electrolux, Stockholm, Sweden

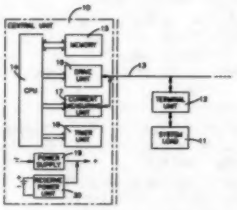
PCT No. PCT/SE87/00173, § 371 Date Nov. 23, 1987, § 102(e) Date Nov. 23, 1987, PCT Pub. No. WO87/06380, PCT Pub. Date Oct. 22, 1987

PCT Filed Apr. 19, 1987, Ser. No. 128,500

Claims priority, application Sweden, Apr. 7, 1986, 8601545

Int. Cl.[4] G08B *26/00*

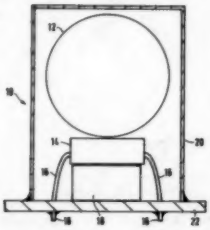
U.S. Cl. 340—518 **7 Claims**



1. In a local control system for system loads, comprising a central unit and a two-wire bus line interconnecting the central unit and the system loads, wherein the system loads are connected to the bus line via terminal units which are responsive to a voltage signal emitted by the central unit and being unique with respect to a respective terminal unit for applying a control signal to a predetermined system load, the central unit being connected to apply a DC voltage to the bus line for supplying operating power to the respective terminal unit and system loads connected to the system, the central unit comprising means for detecting changes in the bus line current and for determining the status of a system load from said changes, the improvement wherein said central unit comprises means for emitting a first signal unique to a respective terminal unit and followed by an additional signal, said respective terminal unit comprising means responsive to the first signal for transferring said additional signal to an output of the terminal unit, and further comprising a manual control unit connected to said output, said manual control unit comprising a keyboard having keys and including means responsive to depression of said keys

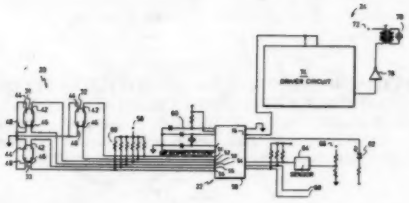
for varying current flowing in said bus line, said central unit being responsive to variation in said current in said bus line for applying a signal including said first and additional signals to said terminal unit said additional signal operating to identify the key being pressed.

4,899,132
MOTION SENSOR
Anatoli Stobbe, Berliner Strasse 5e, D-3000 Hanover, and Wilfried Herrmann, Gehrden, both of Fed. Rep. of Germany, assignors to Anatoli Stobbe, Hanover, Fed. Rep. of Germany
Filed Apr. 11, 1988, Ser. No. 180,186
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1987, 3713416
Int. Cl.[4] G08B *13/24*; G01C *9/06*
U.S. Cl. 340—551 **15 Claims**



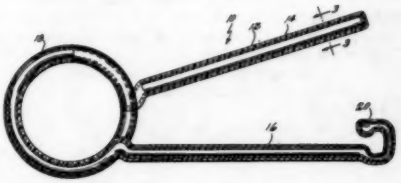
1. A motion sensor for the generation of a signal or a plurality of signals in the presence of a motion acting on the motion sensor, the motion sensor comprising a freely movable body formed of magnetizable material, and a detector comprising a resonant element which responds to changes in a magnetic field.

4,899,133
PROGRAMMABLE MOVEMENT ANALYZER WITH A PLURALITY OF MERCURY SWITCHES
Alan Bartlett, New Braunfels, Tex., assignor to Detex Corporation, New Braunfels, Tex.
Filed Feb. 8, 1988, Ser. No. 153,162
Int. Cl.[4] G08B *23/00*
U.S. Cl. 340—573 **18 Claims**



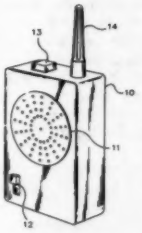
1. A device for warning when a person has ceased normal movement comprising:
a housing;
power supply means coupled to the housing;
means coupled to the housing and operably connected to the power supply means for selectably initiating a warning;
switch means operably connected to the power supply means; and
means connected to the power supply means and warning means for sensing and analyzing movement of a person wearing the device and for enabling operation of the warning means if normal movement ceases, including—
mercury switch means having at least two switches, each switch having structure defining an enclosure, at least a pair of electrical contacts disposed in the enclosure, and a pool of mercury shiftably disposed in the enclosure for electrically connecting and disconnecting the contacts upon motion of the person, the two switch enclosures being skewed relative to each other,
a microcomputer operably connected for receiving separate inputs from each of said two mercury switches, the microcomputer being programmed for determining normal movement from the switch inputs, normal movement being programmed as requiring at least two switches to connect and disconnect electrically within less than about a 30 second period.

4,899,134
NEWBORN ANTI-THEFT DEVICE
Clifford R. Wheeless, Jr., 1006 St. Georges Rd., Baltimore, Md. 21210
Filed Aug. 4, 1988, Ser. No. 228,111
Int. Cl.[4] G03B *23/00*
U.S. Cl. 340—573 **7 Claims**



1. An apparatus for detecting the movement of a newborn within a predetermined area using a sensing system that causes an alarm comprising:
an umbilical cord clamp; and
detectable means disposed inconspicuously inside said umbilical cord clamp for triggering said sensing system and causing said alarm when said detectable means enters said predetermined area.

4,899,135
CHILD MONITORING DEVICE
Mehdi Ghahariiran, 3717 Nobel Dr. No. 1213, San Diego, Calif. 92122
Filed Dec. 5, 1988, Ser. No. 279,968
Int. Cl.[4] G08B *23/00*
U.S. Cl. 340—573 **1 Claim**



1. A range sensitive system employing two or more ultra sonic transceivers to monitor the activities of a child, children or individuals, carrying transceivers monitored by a base trans-

ceiver carried by a guardian wherein the improvement comprises:

a, the transceivers operating in ultra sonic frequency spectrum;

b, the child's transceiver transmitting a constant signal which is received by the guardian's transceiver which converts the signal into an audio tone;

c, the guardian's transceiver having a threshold receiving circuit adjustable to correlate a prescribed distance from the transceiver carried by the child;

d, the loss of a signal from the child's transceiver energizing an audio generator in the guardian's tranceiver;

e, a signal from the guardian's transceiver energizing an audio tone transmitter in the child's transceiver;

f, the child's transceiver carried in a holster having means to open the transmission circuit if the transceiver is removed from the holster; and,

g, the child's transceiver in the holster being attached to the child by a support belt having means to open the transmission circuit if the belt is removed from the child.

4,899,136

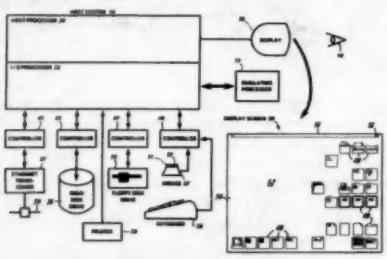
DATA PROCESSOR HAVING A USER INTERFACE DISPLAY WITH METAPHORIC OBJECTS

Marian H. Beard, Sunnyvale; Perry A. Caro, Palo Alto; Jennifer B. Hsiao, San Jose; Kevin J. Mackey; James G. Sandman, Jr., both of Palo Alto; Gary R. Steinbach, Mountain View, and Donald R. Woods, Los Altos, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 28, 1986, Ser. No. 856,525

Int. Cl.[4] G09G *1/00*

U.S. Cl. 340—706 **22 Claims**



1. In a proprietary data processor having a display for displaying information on the screen of said display and user input means connected to said proprietary data processor for input to said display screen,

a user interface on said screen including operative metaphoric objects with which a user interacts via said input means,

said objects including an emulator with operative metaphoric objects currently displayed with the display of operative metaphoric objects of said proprietary data processor and which are both independently and concurrently operative as displayed,

said emulator when opened via said user interaction produces an emulation window on a portion of said display screen allocated thereto by said proprietary data processor and emulating the display screen of a target processor unit,

said emulator having an operating and filing system with a instruction set alien to that of said proprietary data processor,

emulated drive means represented as metaphoric object on said screen,

means to configure said emulator to bind said emulated drive means to the operation of said emulator, and

means in said emulation window to indicate the presence of said emulated drive means.

4,899,137

ARRANGEMENT FOR THE INPUT AND PROCESSING OF CHARACTERS AND/OR GRAPHIC PATTERNS

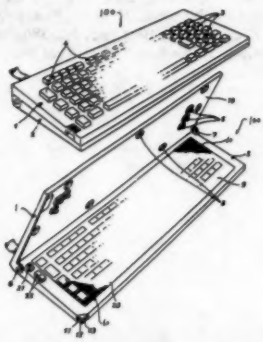
Herbert Behrens, Neuenburg, and Norbert Zeising, Oldenburg, both of Fed. Rep. of Germany, assignors to AEG Olympia Aktiengesellschaft, Wilhelmshaven, Fed. Rep. of Germany

Filed Sep. 26, 1988, Ser. No. 249,303

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1987, 3732519

Int. Cl.[4] G06F *3/02*

U.S. Cl. 340—711 **18 Claims**



1. An apparatus for the selective input of characters and graphic patterns for processing in an electronic data processing system, comprising:

a graphics tablet having an input layer, and a plurality of sensor elements disposed on said input layer which are each actuable to produce electrical signals corresponding to the location of the respective actuated sensor element;

a keyboard which is movable relative to said graphics tablet to a keyboard operating position for keyboard entry of characters and to a second operating position to permit direct entry of information to said input layer, said keyboard having a plurality of movable keys, in said keyboard operating position, each of said movable keys overlying a corresponding predetermined group of sensor elements; and

operating mode detecting means for detecting whether said keyboard is in said keyboard operating position or in said second position for signalling the data processing system to respectively interpret information from said graphics tablet either as characters corresponding to keys on said keyboard, or to graphic patterns corresponding to actuated ones of said plurality of sensor elements.

4,899,138

TOUCH PANEL CONTROL DEVICE WITH TOUCH TIME AND FINGER DIRECTION DISCRIMINATION

Morio Araki; Shigeto Mori; Michihiro Kaneko, and Yasunao Go, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 29, 1988, Ser. No. 161,929

Int. Cl.[4] G09G *3/02*

U.S. Cl. 340—712 **3 Claims**

1. A touch panel control device for outputting control data to select an operation mode for an electronic device according to how a finger touches a touch panel, comprising:

touch position detecting means arranged in a matrix form on said touch panel, for detecting the coordinates of a touch position of said touch panel;

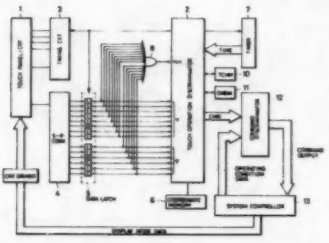
scanning means for periodically scanning said touch position detecting means;

memory means responsive to said touch position detecting means for storing the coordinates of a detected touch position on said touch panel;

coordinate comparing means for comparing, for each scan, said coordinates stored in said memory means with those of a current touch position while a finger touches said panel to determine the direction of finger movement;

timer means for performing a time measuring operation initiated when a finger first touches a touch position on said touch panel as detected by said touch position detecting means and continuing so long as the finger continues to touch said touch position; and

an operation discriminator for selectively outputting said



control data to select an operation mode from a plurality of possible operation modes dependent upon the time measuring operation of said timer means and the results of comparisons of said coordinate comparing means, whereby said operation modes are discriminated based upon the direction of finger movement when the finger moves across the touch panel for more than a predetermined distance, and whereby said operation modes are discriminated based upon the time duration a finger touches said touch panel when the finger moves across said touch panel for less than said predetermined distance.

4,899,139

DISPLAY CONTROL DEVICE FOR SUPERIMPOSING DATA WITH A BROAD CASE SIGNAL ON A TELEVISION SCREEN

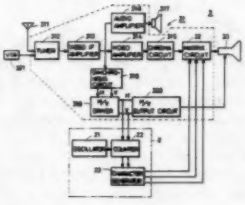
Haruki Ishimochi, Nikko; Kimio Yamamura, Yaita; Yuji Fukuyama, Yaita; Masato Yanai, Yaita, and Satoshi Takahashi, Yaita, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 19, 1983, Ser. No. 524,866

Claims priority, application Japan, Aug. 24, 1982, 57-146573; Aug. 25, 1982, 57-148399; Aug. 26, 1982, 57-148542; Aug. 30, 1982, 57-151341

Int. Cl.[4] G09G *1/00*

U.S. Cl. 340—721 **4 Claims**



1. A cathode-ray tube control apparatus for connecting a personal computer with a television receiver to superimpose information provided by the computer on the picture of a television broadcast, the control apparatus comprising:

means for storing data to be displayed, said means for storing receiving said information provided by said computer for storage therein as said data;

oscillator means for producing clock signals in synchronism with horizontal and vertical synchronizing signals developed by said television receiver;

means for developing timing signals defining a horizontal scanning display period, a horizontal scanning retrace period, a vertical scanning display period, and a vertical retrace period by counting the clock signals produced by said oscillator means;

means for controlling the read-out of data to be displayed, from said means for storing, in accordance with said timing signals received from said means for developing and for supplying the data for display on said television receiver;

means for supplying said timing signal defining said vertical retrace period to said personal computer;

said personal computer including means for processing information, said means for processing information being enabled in response to said timing signal defining said vertical retrace period to thereby perform processing of information during said vertical retrace period;

said timing signals including a character timing signal, said character timing signal including a plurality of character representation pulses each representative of a character having a predetermined number of display dots, all multiples of said character representation pulses having a frequency different from a chrominance subcarrier frequency of a signal supplied to said television receiver to develop the picture of a television broadcast;

said timing signal developing means including,

means for counting said character representation pulses, and

means for modifying the count of said means for counting so as to alter a length of character representation pulses developed during each of the horizontal scanning retrace periods so that said chrominance subcarrier frequency is a multiple of the frequency of the total of said character representation pulses developed during both said horizontal scanning retrace period and said horizontal scanning display period;

said picture elements thereby being developed horizontally on the screen of the television receiver to form one picture of said television broadcast.

4,899,140

DISPLAY DEVICE FOR COPYING MACHINES AND THE LIKE

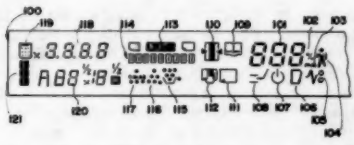
Masazumi Ito, Toyohashi; Kadotaro Nishimori, Toyokawa, and Masaaki Oyabu, Aichi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 11, 1987, Ser. No. 96,591

Claims priority, application Japan, Sep. 13, 1986, 61-216143; Sep. 13, 1986, 61-216144

Int. Cl.[4] G09G *3/04*

U.S. Cl. 340—756 **7 Claims**



1. A display device, for use with copying machines, having a first display for displaying a number of copies to be produced, a second display for displaying a magnification ratio to be used for copies and additional indicators provided between the first and second displays, the display device comprising:

means for storing data of a total copy number of copies made on the copying machine, data of the magnification ratio and data of the number of copies to be produced, the data stored in said storing means being applied to said first and second displays;

means for activating the display of the data of the total copy number stored in the storing means;

means, in response to the activating means, for dividing the data of the total copy number into high-order columns and low-order columns so as to display the low-order columns and the high-order columns in the first and second displays respectively, and

means, in response to the activating means, for controlling the additional indicatois on the display device so as to turn off or reduce the intensity of light emissions of the additional indicators relative to the first and second displays when the means for activating is enabled to inform the operator that a mode of operation showing a total number of copies is being displayed jointly on the first and second displays.

4,899,141

MATRIX PANEL WITH AN ACTIVE DRIVING SYSTEM

Shinji Morozumi; Toshiyuki Misawa, and Yoshio Nakazawa, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

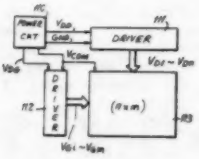
Continuation of Ser. No. 481,049, Mar. 31, 1983, Pat. No. 4,591,848. This application Feb. 20, 1986, Ser. No. 831,202

Claims priority, application Japan, Apr. 1, 1982, 57-54339; Apr. 6, 1982, 57-56945

The portion of the term of this patent subsequent to May 27, 2003, has been disclaimed.

Int. Cl.[4] G09G *3/36*

U.S. Cl. 340—784 **38 Claims**



1. An active driving system for a liquid crystal matrix panel having a plurality of cells each including switching means having a switching terminal for switching the cell on and off during selected and non-selected periods respectively and a picture element, said matrix panel receiving an external video signal adapted to a cathode ray tube display and a frame signal, the active driving system comprising: scaling means for amplifying the external video signal to produce two scaled video signals having bias voltages and amplitudes of opposite polarities, the scaling means being adapted to produce voltages in a range between a high driving voltage and ground and the switching terminal voltage of each of the switching means during non-selected periods is in the voltage range of the scaling means.

4,899,142

RING NETWORK SYSTEM AND CONFIGURATION CONTROL METHOD

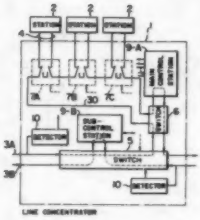
Susumu Nakayashiki, Yokohama; Jiro Kashio, Kawasaki; Takeshi Harakawa; Yoshinori Bekki, both of Hadano, and Mitsuhiro Yamaga, Kawasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 4, 1987, Ser. No. 46,031

Claims priority, application Japan, May 2, 1986, 61-100902; Jul. 18, 1986, 61-167919

Int. Cl.[4] H04Q *3/00*; H04J *3/14*

U.S. Cl. 340—825.050 **22 Claims**



1. A ring network system comprising:

a plurality of line concentrator means each having at least one station connected thereto by a pair of branch lines; and

at least one ring transmission path for interconnecting said plurality of line concentrator means in a ring configuration;

wherein each line concentrator means includes

an internal transmission line having a plurality of port means for connecting said pairs of branch lines to said internal transmission line, wherein each port means is connected to a pair of branch lines and wherein said internal transmission line interconnects each of said pairs of branch lines and said ring transmission path in series to each other; and

switch means for disconnecting said internal transmission line from said ring transmission path to form a local ring which includes said pairs of branch lines and said internal transmission line while maintaining said ring transmission path in a conductive state at said each line concentrator means.

4,899,143

HIGH CAPACITY COMMUNICATION SYSTEM OVER COLLISION-TYPE CHANNELS

Bhaskarpillai Gopinath, Berkeley Heights, and Shuo-Yen R. Li, Gillette, both of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Apr. 21, 1988, Ser. No. 184,509

Int. Cl.[4] H04Q *1/20, 1/30*

U.S. Cl. 340—825.5 **7 Claims**

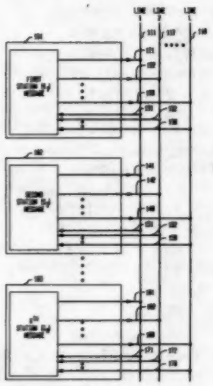
1. A method for transmitting a multiplicity of messages over a plurality of Collision-type lines interconnecting numerous synchronized stations, wherein each message is generated by a corresponding station and is partitioned into a number of bit intervals, and wherein a Collision-type line propagates a composite logic level having: a logic zero level whenever no station transmits a logic one bit; a logic one level whenever only one station transmits a logic one bit; and a logic two level whenever two or more logic one bits are transmitted over the line by the stations, the method for any arbitrary bit interval comprising the steps of

assigning available ones of the lines to corresponding ones of the stations,

broadcasting a logic level by each of the stations over a corresponding one of its assigned lines to produce a composite logic level on each line,

detecting the composite logic level on each line by all the stations,

for each line having a composite logic one level and thereby identifying a unique message, assigning only the station generating said unique message with said corresponding one of its assigned lines for the remaining bit intervals, and



identifying those lines not propagating a unique message as available for subsequent assignment during operation of the method following said arbitrary bit interval,

wherein said composite level on each line after the last bit interval determines successfully transmitted messages.

4,899,144

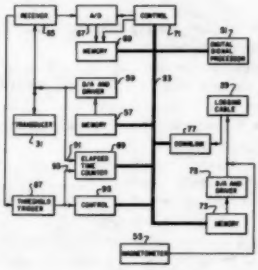
METHOD OF TRANSMITTING ULTRASONIC AMPLITUDE & TIME TRAVEL INFORMATION OVER A LOGGING CABLE

Donald G. Kyle, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 29, 1988, Ser. No. 291,522

Int. Cl.[4] G01V *1/00*

U.S. Cl. 340—856 **5 Claims**



1. A method of transmitting data over a cable connecting an ultrasonic logging apparatus and surface equipment, said data derived from an acoustic return from the ultrasonic logging apparatus operating in a well borehole, said ultrasonic logging apparatus generating an acoustic waveform and receiving the acoustic return from said generated acoustic waveform, said acoustic return having a peak amplitude and a time of travel as measured from said generated acoustic waveform, comprising the steps of:

(a) providing transmitting means in said ultrasonic logging apparatus to transmit electrical signals over said cable;

(b) producing a synchronization signal with said transmitting means, said synchronization signal being synchronized with said generated acoustic waveform, and transmitting said synchronization signal over said cable with said transmitting means;

(c) determining the time of travel and the peak amplitude of said acoustic return;

(d) producing with said transmitting means a time travel signal at a time interval from said synchronization signal corresponding to the time of travel of said acoustic return, and transmitting said time travel signal over said cable with said transmitting means;

(e) producing an amplitude signal with said transmitting means, said amplitude signal having an amplitude corresponding to the peak amplitude of said acoustic return, and transmitting said amplitude signal over said cable with said transmitting means.

4,899,145

ENCODER AND METHOD OF ADJUSTING MAGNETIC FIELDS OF THE SAME

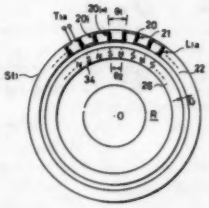
Hironori Okuda, Kobe, and Takashi Matsubara, Nishinomiya, both of Japan, assignors to Shin Meiwa Industry Co., Ltd., Hyogo, Japan

Filed Jun. 26, 1986, Ser. No. 878,659

Claims priority, application Japan, Jul. 3, 1985, 60-148476; Aug. 6, 1985, 60-173926; Mar. 31, 1986, 61-074933

Int. Cl.[4] H03M *1/22*

U.S. Cl. 341—15 **24 Claims**



1. An encoder having a stator and a movable element facing each other for magnetically detecting relative positional relation between said stator and said movable element, said encoder comprising:

multipole magnetic field generating means provided in one of said movable element and said stator; and

magnetic field detecting means provided in the other of said stator and said movable element and facing said multipole magnetic field generating means,

said magnetic field detecting means having a plurality of magnetic cores formed by a magnetic substance having magnetization characteristics with low hysteresis and arrayed at a pitch corresponding to a magnetic pole pitch in said multipole magnetic field generating means, and magnetic field detecting coils extended across respective ones of said plurality of magnetic cores to be magnetically coupled with said plurality of magnetic cores.

4,899,146

METHOD OF AND APPARATUS FOR CONVERTING DIGITAL DATA BETWEEN DATA FORMATS

J. B. Podolak, Schaumburg, and Ronald B. Saluski, Bolingbrook, both of Ill., assignors to R. R. Donnelley & Sons Company, Chicago, Ill.

Division of Ser. No. 44,238, Apr. 30, 1987, Pat. No. 4,816,829. This application Dec. 16, 1988, Ser. No. 285,092

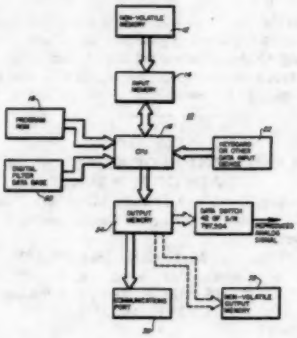
Int. Cl.[4] H03M *5/10*

U.S. Cl. 341—51 **4 Claims**

1. A method of converting digital data encoded in one format into digital data encoded in a different format wherein the

data of the one format comprises a series of words each having a first plurality of bits defining the amplitude of an analog signal at the beginning of an interval thereof and a second plurality of bits defining the length of the interval and wherein the data of the different format comprises a further series of words representing the amplitude of the analog signal at the beginning of further intervals thereof whereby the further intervals are of equal duration, comprising the steps of:

(a) selecting a word of the one format;



(b) analyzing the second plurality of bits of the selected word to determine the number of further intervals contained in the interval represented by the selected word;

(c) utilizing the first plurality of bits of the selected word to determine the amplitude of the analog signal at the beginning of each further interval;

(d) encoding a number of words of the different format, each word representing an amplitude determined in step (c);

(e) selecting a further word of the one format; and

(f) repeating steps (b)–(e) to derive the data of the different format.

4,899,147

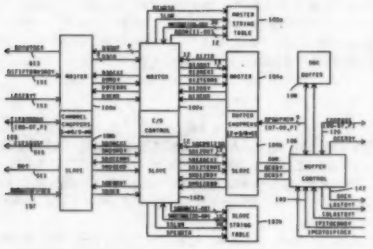
DATA COMPRESSION/DECOMPRESSION APPARATUS WITH THROTTLE, START-UP AND BACKWARD READ CONTROLS

Anthony P. Schiavo, Lafayette Hill; Paul H. Selby, III, Norristown, and Harold L. Gibson, Lansdale, all of Pa., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Jun. 3, 1988, Ser. No. 202,733

Int. Cl.[4] H03M 7/30

U.S. Cl. 341—60 **13 Claims**



1. A data compression system for compressing incoming data characters, said system comprising:

a string table having a plurality of addressable storage locations each capable of storing a prefix code, a string code and a sub-block count;

a string code counter for producing an output signal upon reaching a predetermined count;

means for incrementing said code counter each time a string code is written into said string table;

a sub-block counter;

means responsive to said output signal for incrementing the count in said sub-block counter;

address hashing means responsive to an incoming data character for successively addressing said string table to read the prefix code and sub-block count from the addressed locations;

comparing means for comparing each sub-block count read from said string table with the count in said sub-block counter and producing a comparison signal when they are equal; and,

means responsive to said comparing means for writing the sub-block count in said sub-block counter, the string code in said code counter and a prefix code into said string table only if said comparing means does not produce said comparison signal.

4,899,148

DATA COMPRESSION METHOD

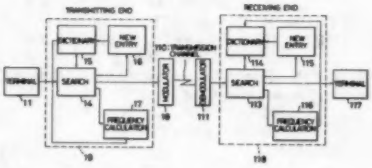
Takuro Sato; Yoshihito Shimazaki, and Manabu Kawabe, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Feb. 19, 1988, Ser. No. 157,691

Claims priority, application Japan, Feb. 25, 1987, 62-40453; Feb. 25, 1987, 62-4054

Int. Cl.[4] H03M 7/40

U.S. Cl. 341—65 **4 Claims**



1. A method of compressing text data including character codes, comprising the steps of:

extracting input words from the text data, each input word including a series of word codes composed of one or more character codes;

providing a dictionary containing, as entries, words composed of characters;

storing a word code in association with each of said words contained in said dictionary;

storing occurrence counts of respective words contained in the text data to be compressed;

searching said dictionary to determine whether a selected input word from the text data to be compressed matches any of said words contained in said dictionary;

producing, if said selected input word is determined to match any of said words contained in said dictionary, the word code assigned to the word contained in said dictionary which said input word has been found to match;

updating, if said selected input word is determined to match any of said words contained in said dictionary, the respective one of said occurrence counts of said word contained in said dictionary which said input word has been found to match; and

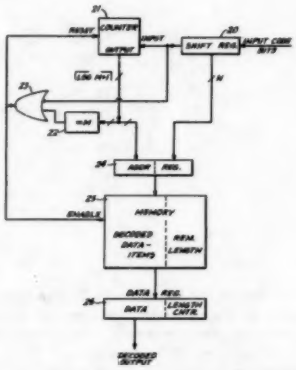
entering, if said input word is not determined to match any of said words in said dictionary, said input word as a new word in said dictionary.

4,899,149

METHOD OF AND APPARATUS FOR DECODING HUFFMAN OR VARIABLE-LENGTH COEES

Gary Kahan, 444 Neptune Ave., Brooklyn, N.Y. 11224

Filed Feb. 28, 1986, Ser. No. 834,636
Int. Cl.[4] H03M 7/42
U.S. Cl. 341—67 **13 Claims**



1. A method for decoding input variable-length code-words wherein each code-word is divided into two parts, a prefix part consisting of the first 0 bit together with all the preceding 1 bits and a remainder part consisting of all the bits following the first 0 bit, whereby fixed-length binary data-symbols corresponding to said input code-words are stored in sections of a decoding table that correspond to the different code-word prefixes, said decoding method comprising the following two steps:

first, determining the position of the first 0 bit in each input code-word and thus the code-word prefix, where said prefix specifies a section in the decoding table; and

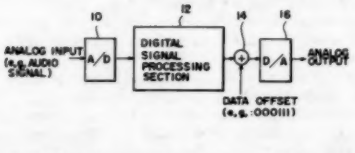
second, using the input bits following the first 0 bit which include the code-word remainder to specify an address in said decoding table section and thus retrieve the data-symbol corresponding to a given input code-word.

4,899,150

DIGITAL SIGNAL PROCESSING CIRCUIT

Masayuki Iwamatsu, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Mar. 22, 1988, Ser. No. 171,687
Claims priority, application Japan, Mar. 26, 1987, 62-72600
Int. Cl.[4] H03M 1/08
U.S. Cl. 341—118 **2 Claims**



1. A digital signal processing circuit comprising:

digital signal processing means for receiving input digital signal data and subjecting the input digital signal data to digital signal processing in which frequency characteristics of the digital signal data are changed;

data offset means receiving output of said digital signal processing means for providing data offset to the input digital signal data; and

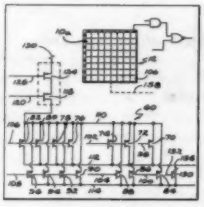
digital-to-analog conversion means receiving an output of said data offset means for converting the input digital signal; data to analog voltage signal data and delivering this analog voltage signal data, said digital-to-analog conversion means including plural weighted current sources corresponding to the number of bits of the conversion means which are turned on and off by respective bit signals and a current-to-voltage converter for converting the summed current from the current sources to said analog voltage signal data, wherein the current value provided by the current source corresponding to the most significant bit of the conversion means is set at a value different from its proper weighted value in comparison with the other current sources so as to improve linearity of conversion.

4,899,151

APPARATUS FOR CONVERTING DIGITAL VALUES TO ANALOG VALUES

Joseph H. Colles, Oceanside, Calif., assignor to Brooktree Corporation, San Diego, Calif.

Filed Oct. 6, 1986, Ser. No. 915,784
Int. Cl.[4] H03M 1/68
U.S. Cl. 341—145 **14 Claims**



1. In combination for converting a digital value into an analog value,

means for providing a plurality of first input signals each coding for an individual binary bit of relatively high binary significance and each having logic levels respectively coding for binary "1" and binary "0",

a plurality of output members disposed electrically in a matrix relationship in a pair of co-ordinate directions,

means responsive to the first input signals for energizing particular ones of the output members in the plurality, each with a particular magnitude, to indicate in analog form the binary value coded by the logic levels of the first input signals,

there being an additional output member in the matrix relationship, such additional member being other than the output members in the plurality,

means for providing a plurality of second input signals each coding for a binary bit of individual binary significance and of lower binary significance than the binary bits represented by the first input signals and each having logic levels respectively coding for a binary "1" and a binary "0",

the first and second input signals cumulatively coding for the digital value,

means for decoding the second input signals to produce an analog signal having an amplitude dependent upon such decoding and for energizing the additional output member with a magnitude, less than the particular magnitude, dependent upon the amplitude of such analog signal, and

means for providing an output indication cumulatively representing the sum of the magnitudes of energizing the particular output members and the additional output member.

4,899,152

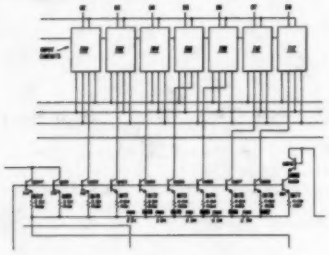
METHOD AND APPARATUS FOR TEMPERATURE COMPENSATING A DIGITAL TO ANALOG CONVERTER

Jeffrey G. Barrow, Oak Ridge, N.C., and Adrian P. Brokaw, Burlington, Mass., assignors to Analog Devices, Inc., Norwood, Mass.

Division of Ser. No. 945,654, Dec. 23, 1986, Pat. No. 4,742,331. This application May 2, 1988, Ser. No. 189,316

Int. Cl.[4] H03M 1/78

U.S. Cl. 341—154 **27 Claims**



1. A method of operating a digital-to-analog converter having a plurality of parallel-connected transistors with emitters connected to an R-2R resistor network to cause the transistors to operate as binary-weighted current sources, said transistors being arranged in order from a most significant bit transistor to a least significant bit transistor, to compensate for errors introduced by varying emitter currents, said method comprising the steps of:

A. drawing a current through the digital-to-analog converter which is proportional to absolute temperature, and

B. applying to said R-2R resistor network at the least significant bit end a compensating current generated by placing across a resistor of value 2R a compensating voltage generated by means including a transistor having an emitter area which is larger than the emitter area of the least significant bit transistor so that said compensating voltage has a magnitude of 2(kT/q) ln 2 volts greater than the base-emitter voltage of the least significant bit transistor.

4,899,153

FAST HIGH-RESOLUTION ANALOG-TO-DIGITAL CONVERTER

Lanny L. Lewyn, Laguna Beach, Calif., assignor to Brooktree Corporation, San Diego, Calif.

Filed Apr. 3, 1986, Ser. No. 846,545

Int. Cl.[4] H03M 1/14

U.S. Cl. 341—156 **54 Claims**

1. In combination for converting between analog values and binary coded values,

means for providing a signal having an amplitude representing the analog value,

a plurality of switches each having first and second states of operation,

means for connecting the switches in sub-sets each having an individual binary significance, the switches in the sub-sets being connected in a repetitive array,

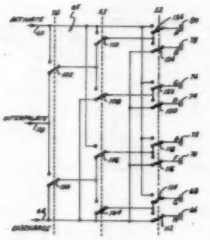
a plurality of output members each constructed to store energy,

energizing means for the output members,

means for connecting the output members to the switches in the repetitive array and to the energizing means to obtain a storage of energy in the output members in accordance with the operation of the switches in the repetitive array in the first and second states,

means responsive to the analog signal for storing energy representative of the amplitude of such signal,

comparator means responsive to the energy stored in the output members and in the analog storage means for comparing the magnitudes of the energy stored in such means and for producing a signal having an amplitude representing any difference in any such comparison,



means responsive to the signals from the comparator means for storing in binary coded form signals having logic levels cumulatively representing the amplitude of the signal from the comparator means, and

means responsive to the signals from the last mentioned storage means for activating the switches in the different sub-sets in accordance with the logic levels of such signals to provide a binary indication in such switches of the amplitude of the signal from the comparator means.

4,899,154

FLASH COMPARATOR

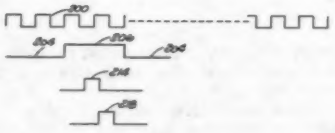
Joseph H. Colles, Oceanside, Calif., assignor to Brooktree Corporation, San Diego, Calif.

Filed Jul. 26, 1988, Ser. No. 224,871

Claims priority, application Switzerland, Aug. 13, 1987, 3120/87

Int. Cl.[4] H03M 1/36

U.S. Cl. 341—159 **24 Claims**



1. In combination in a flash comparator,

means for providing an input voltage,

means for providing a reference voltage,

first means operative at first particular times for producing a first current in accordance with the magnitude of the input voltage,

second means for producing a second current in accordance with the magnitude of the reference voltage,

first terminal means responsive to the first current for producing a first voltage in accordance with the magnitude of the first current,

second terminal means responsive to the second current for producing a second voltage in accordance with the magnitude of the second current,

the first means being responsive to the reference voltage at second particular times different from the first particular times to produce a third current in accordance with the magnitude of the reference voltage,

means responsive to any difference between the magnitudes of the second and third currents during the second partic-

ular times to provide voltages compensating for any such difference, and

means responsive to the compensating voltages for introducing such compensating voltages to the first and second terminal means in the first particular times to provide a compensation in the first time periods of any differences between the magnitudes of the second and third currents in the second time periods.

4,899,155

APPARATUS AND METHOD FOR ANALOGUE TO DIGITAL CONVERSION

Thomas Jackson, Hanwell, England, assignor to Plessey Overseas Limited, Ilford, England

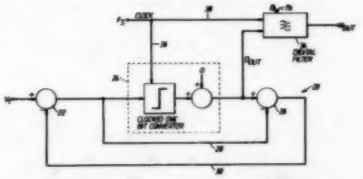
PCT No. PCT/GB86/00029, § 371 Date Nov. 14, 1986, § 102(e) Date Nov. 14, 1986, PCT Pub. No. WO86/04470, PCT Pub. Date Jul. 31, 1986

PCT Filed Jan. 16, 1986, Ser. No. 914,842

Claims priority, application United Kingdom, Jan. 16, 1985, 8501034

Int. Cl.[4] H03M *1/12*

U.S. Cl. 341—200 **6 Claims**



1. An interpolating analogue to digital converter, comprising:

a first analogue signal combiner having first and second inputs, and an output, and being arranged to receive at said first input a continuously variable analogue input signal having a predetermined bandwidth and being arranged to receive at said second input a quantization error signal in analogue form and to provide at said output a combined version of the signals at said first and second inputs;

a one step digital quantizer means directly coupled to said output of the first signal combiner for producing a binary valued quantized signal, and clock means connected to the quantizer means having a clock rate substantially greater than the predetermined bandwidth of the input signal;

a second signal combiner having a first input, a second input and output, the first input being coupled to receive said quantized signal and a second input being directly coupled to said output of the first signal combiner to receive a feed forward signal therefrom whereby to provide at said output of the second signal combiner said quantization error signal; and,

feedback means for directly coupling the quantization error signal to the second input of the first combiner;

the arrangement being such that said quantizer means provides a serial output of pulses representing a digitized value of the input signal.

4,899,156

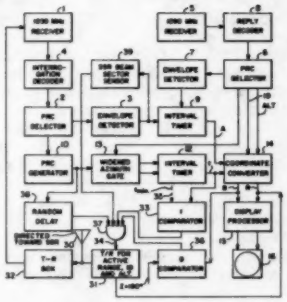
VIRTUAL ATCRBS USING SIGNALS OF REMOTE SSR

George B. Litchford, Northport, and Burton L. Huland, Glenwood Landing, both of N.Y., assignors to Litchstreet Company, Northport, N.Y.

Continuation of Ser. No. 65,779, Jun. 24, 1987, abandoned. This application Jul. 13, 1989, Ser. No. 379,651

Int. Cl.[4] G01S *13/74*

U.S. Cl. 342—37 **16 Claims**



1. In a system for indicating the position of a transponder with respect to a reference position at a known location within the service area of a secondary surveillance radar (SSR) by receiving at said location interrogations from said SSR and replies from the transponder and determining the position of the transponder from the time relationships between said received interrogations and replies, the improvement comprising, at said reference position:

(a) an antenna;

(b) active range measuring transmitter-receiver means coupled to said antenna;

(c) means for providing a control output in response to the presence of the transponder in an area on or close to a line between the reference position and the SSR which is geometrically unfavorable to passive determination of its range; and

(d) means responsive to said control output to actuate said active range measuring means briefly and intermittently.

4,899,157

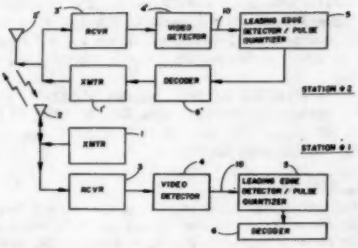
LEADING EDGE DETECTOR/REPLY QUANTIZER

Norman R. Sanford, Cockeysville; Bernard J. Lyons, and Robert C. Yienger, both of Baltimore, all of Md., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Apr. 3, 1989, Ser. No. 332,135

Int. Cl.[4] G01S *13/74*

U.S. Cl. 342—40 **20 Claims**



1. In a pulse code communications system having a receiver, a video detector producing a composite video signal which

may be formed by interfering pulse signals received by said receiver and a leading edge detector/pulse quantizer for processing said composite video signal to separate interfering pulses therein, said leading edge detector including:

a source of clock signals;

means responsive to the amplitude and rate of change of amplitude of said composite video signal to provide:

(a) a positive slope (PS) signal which persists during the time said rate of change of amplitude increases at a predetermined rate;

(b) a negative slope (NS) signal which persists during the time said rate of change of amplitude decreases at a predetermined rate; and

(c) a quantized video (QV) signal which persists during the time said amplitude exceeds a predetermined level;

a first shift register for propagating said PS signals according to their relative times of appearance;

a second shift register for propagating said NS signals according to their relative times of appearance;

a third shift register for propagating said QV signals according to their relative times of appearance;

each of said first, second and third registers propagating the signals contained therein at a rate determined by said clock signals;

first logic means for examining the contents of said first and third registers to determine the truth of a condition in which:

said third register contains a signal which has persisted for two or more clock signals after the appearance of a first signal in said first register; and for inserting a signal in said first register at a position two clock signals after said first signal therein if said condition is true;

second logic means for examining the contents of said first and second registers to determine the truth of a condition in which:

a signal is present in said second register at a position of between 11 and 18 clock signals after a first signal appears in said first register and no second signal is present in said first register in said 11–18 clock signal interval; and for inserting a second signal in said first register at a position corresponding to a time of 7 clock signals before the time of appearance of said signal in said second register; and

means for unloading the contents of said first register in serial-by-bit format after operation of said first and second logic means:

the improvement wherein said first logic means further includes:

means for determining the truth of a second condition in which:

a first and second signal are present in said first register separated by one clock signal interval and said third register contains a signal at the time said first signal of said first register ends; and

means for deleting said second signal from said first register if said second condition is not true.

4,899,158

MOVING OBJECT DISCRIMINATING SYSTEM

Takashi Saeki; Takayuki Nii; Hirotake Fukui; Toshiro Mishina; Haruo Nakano, and Hitoshi Sakakibara, all of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

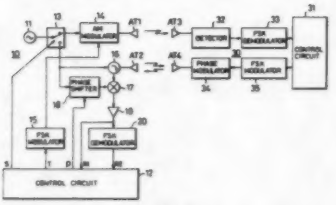
Filed Sep. 13, 1988, Ser. No. 243,833

Claims priority, application Japan, Sep. 26, 1987, 62-242086; Sep. 26, 1987, 62-242088; Jan. 14, 1988, 63-5928; Jan. 14, 1988, 63-5929; Apr. 25, 1988, 63-101789

Int. Cl.[4] G01S *13/78*

U.S. Cl. 342—44 **6 Claims**

1. A moving object discriminating system comprising an interrogator which transmits a transmission signal, and a responder which is mounted to a moving object and stores data for said moving object, said responder including a control means for processing said transmission signal received from said interrogator and for answering said interrogator, wherein said responder further including a phase modulator which modulates the phase of an answer signal supplied from said responder to said interrogator with said data stored in the responder, and said interrogator further including means for processing said answer signal to discriminate therefrom said moving object, an oscillator which oscillates a non-modulated signal of a fixed frequency toward said responder, and a comparator for comparing the phase of said oscillated signal with that of said answer signal from said responder and a phase shifter disposed between said oscillator and said phase comparator for providing a phase shift to an output of said oscillator so as to provide the phase comparator with a reference signal to permit the phase comparator to generate a sufficient demodulating output for processing said answer signal.



4,899,159

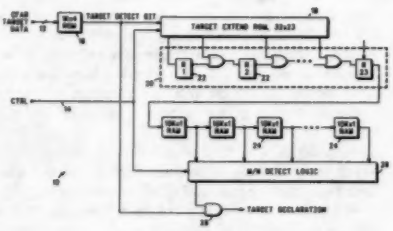
METHOD AND DEVICE FOR A M-OUT-OF-N DETECTION SCHEME

Jeffrey D. Marchant, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 1, 1988, Ser. No. 226,910

Int. Cl.[4] G01S *7/30, 13/04*

U.S. Cl. 342—90 **5 Claims**



3. A M-out-of-N detections method comprising the steps of:

providing target detections for each of a plurality of integration periods;

extending said target detections in both range directions;

storing extended target detections for each integration period;

analyzing each of said extended targets in said integration periods using a M-out-of-N determination; and

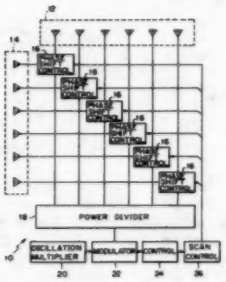
outputting a target declaration if said M-out-of-N determination has been met.

4,899,160

GUIDANCE EQUIPMENT FOR MICROWAVE LANDING SYSTEM

Yoshihiko Kuwahara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 20, 1988, Ser. No. 246,683
Claims priority, application Japan, Sep. 21, 1987, 62-236487
Int. Cl.[4] G01S 1/16, 1/18
U.S. Cl. 342—408 2 Claims



1. Guidance equipment for a microwave landing system, comprising:

an azimuth radiating element array producing a first scanning beam for azimuth guidance, said azimuth radiating element array including a plurality of azimuth radiating elements;

an elevation radiating element array producing a second scanning beam for elevation guidance, said elevation radiating element array including a plurality of elevation radiating elements;

oscillation multiplier means for generating a radio frequency signal;

a control circuit outputting a preamble signal and transmission timing signals which are individually assigned to said first scanning beam and said second scanning beam;

modulator means for modulating said radio frequency signal with said preamble signal and for transmitting a modulated radio frequency signal together with said radio frequency signal responsive to said transmission timing signals;

a plurality of phase shift control means for distributing a plurality of signal power signals which are fed to said plurality of phase shift control means, each of said phase shift control means individually responding to a control signal for controlling a level of signal power and a drive phase applied to one azimuth radiating element of said azimuth radiating element array during a first time period and to one elevation radiating element of said elevation radiating element array during a first time period;

power divider means for distributing signal power outputted by said modulator means to said plurality of phase shift control means; and

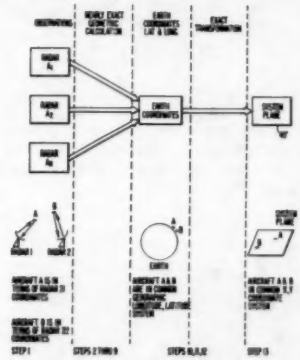
scanning control means for delivering said control signal to each of said plurality of phase shift control means in response to said transmission timing signals and for controlling said plurality of phase shift control means such that at a transmission timing of said preamble signal a radiation pattern characteristic of said elevation radiating element array is changed.

4,899,161

HIGH ACCURACY COORDINATE CONVERSION METHOD FOR AIR TRAFFIC CONTROL APPLICATIONS

Wilfred W. Morin, Jr., Sea Isle City, N.J., and Barry Wasser, Potomac, Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 21, 1988, Ser. No. 222,588
Int. Cl.[4] G01S 3/02, 13/00; G01C 15/20; G06K 15/00
U.S. Cl. 342—451 4 Claims



1. In an air traffic control system, including a plurality of radar stations, located on the surface of the Earth, operatively connected to a data processing system, a computer method for displaying the location of aircraft detected by said radar stations, comprising the steps of:

receiving the slant range, azimuth and altitude measurements of an aircraft at a first one of said radar stations;

computing the geodetic latitude and longitude of said aircraft in an ellipsoidal reference system;

computing the conformal latitude and longitude of the aircraft in a conformal spherical reference system;

projecting the conformal latitude and the longitude of said aircraft from said conformal spherical reference system to a system plane by means of a stereographic projection;

whereby aircraft positions are depicted accurately and all angles are preserved.

4,899,162

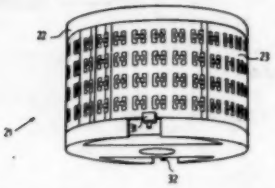
OMNIDIRECTIONAL CYLINDRICAL ANTENNA

Jean-Christophe M. Bayetto, Betton, and Claude J. Vinatier, Rennes, both of France, assignors to L'etat Francais, Represente par le Ministre des PTT (CNET) and Etablissement Public de Diffusion dit Telediffusion de France, both of, France

Continuation of Ser. No. 869,412, Jun. 2, 1986, abandoned. This application Jul. 13, 1988, Ser. No. 220,993
Claims priority, application France, Jun. 10, 1985, 85 08840
Int. Cl.[4] H01Q 21/20
U.S. Cl. 343—700 MS 7 Claims

1. An antenna array with a circular symmetry, said antenna comprising a cylindrical surface having a circumference; an array of elementary radiating sources in three layer printed circuits, each elementary radiating source being applied on said cylindrical surface; a plurality of said elementary radiating sources being arranged in successive circular rows which are longitudinally distributed across said cylindrical surface; said elementary radiating source centers in each circular row being angularly separated by a constant angular step, the sizes, angular width and longitudinal length of each elementary radiating source being substantially smaller than the circumference of the cylindrical surface; each elementary radiating source hav-

ing, when still planar and before being applied onto said cylindrical surface, a linearly polarized directive diagram; adjacent elementary radiating source centers being separated by a distance in the order of 0.9 λo, where λo is the free space wave-



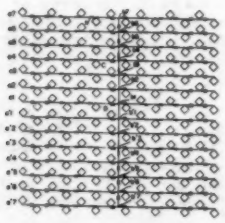
length of a carrier frequency transmitted by the antenna, all said elementary radiating sources being fed in phase by signals having the same amplitude through a three conductor layer feed triplate line.

4,899,163

MICROWAVE PLATE ANTENNA IN PARTICULAR FOR DOPPLER RADAR

Jean-Pierre L. M. Daniel, Rennes; Phillipe Dupuis, Perros Guirec, and Jean-Luc Alanic, Treguier, all of France, assignors to Le Centre Regional D'Innovation et de Transfert de Technologie de Bretagne Loi Le Centre National de la Recherche Scientifique, Etablissement Public National a Caractere Scientifique et Technologiqu, France

Filed Aug. 9, 1988, Ser. No. 230,466
Claims priority, application France, Sep. 9, 1987, 87 12579
Int. Cl.[4] H01Q *1/38*
U.S. Cl. 343—700 MS 13 Claims



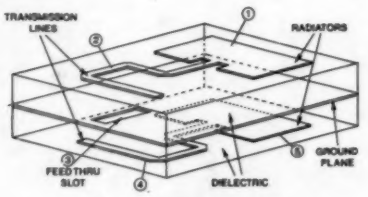
1. A microwave antenna having a Janus configuration for use in a doppler radar system, said antenna comprising a printed circuit board having thereon a plurality of substantially identical parallel and symmetrical elongated linear sub-networks, the pitch between said sub-networks being equal to a wave length of said signal, each of said sub-networks having an even number of radiating elements disposed at regular intervals along said sub-networks, each of said sub-networks having a center of symmetry aligned along a line perpendicular to said elongation of said linear sub-networks, said parallel networks being separated from each other by a uniform pitch, means for feeding each of said sub-networks an in-phase signal corresponding to the operational frequency of said antenna, said sub-networks radiating fields being dephased by 180° from one radiating element to the following radiating element.

4,899,164

SLOT COUPLED MICROSTRIP CONSTRAINED LENS

Daniel T. McGrath, Fairfax, Va., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 16, 1988, Ser. No. 245,843
Int. Cl.[4] H01Q *19/06*
U.S. Cl. 343—754 6 Claims



1. A slot coupled microwave beamforming lens system comprising:

a planar lens which has an aperture side and a feed side;

a plurality of apertures side antenna elements which are housed upon said aperture side of said planar lens, said aperture side antenna elements being regularly distributed over said aperture side;

a plurality of feed side antenna elements which are housed upon said feed side of said planar lens with a distribution that varies as a function of radius to provide a first degree of freedom to said microwave array beamforming lens system;

a plurality of aperture side transmission lines with lengths that vary as a function of radius of said planar lens to help provide a second degree of freedom in said planar microwave array beamforming lens, each of said plurality of aperture side transmission lines being electrically connected to one of said aperture side antenna elements;

a plurality of feed side transmission lines with lengths that vary as a function of radius of said planar lens to help provide said second degree of freedom, each of said plurality of feed side transmission lines being electrically connected to one of said feed side antenna elements; and

a metal ground plane which is fixed in parallel between said aperture side and feed side antenna elements and said aperture side and feed side transmission lines, said metal ground plane having a plurality of feed-through slots, each of which electrically connect one said aperture transmission lines with one of said feed side transmission lines by having each of said plurality of feed-through shots being positioned directly between one of said plurality of aperture side and feed side transmission lines so that they extend just past said feed-through slot's center, so that each of said feed-through slots can conduct microwave energy therebetween.

4,899,165

VARIABLE CIRCULAR POLARIZATION ANTENNA HAVING PARASITIC Z-SHAPED DIPOLE

John L. Schadler, Lindelwold, N.J., assignor to General Signal Corporation, Stamford, Conn.

Filed Oct. 20, 1988, Ser. No. 261,049
Int. Cl.[4] H01Q *13/12, 11/14*
U.S. Cl. 343—767 7 Claims

1. A circularly polarized antenna system comprising:

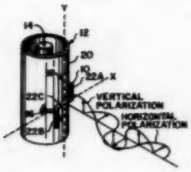
a conductive cylindrical mast having a slot extending axially at the outer periphery of the mast;

means for feeding said slot for exciting horizontally polarized waves;

a parasitic Z-shaped dipole spaced radially outwardly from said slot, and in the same horizontal plane as the horizontally polarized waves from said slot, for exciting vertically

polarized waves in phase quadrature with said horizontally polarized waves;

said Z-shaped dipole having a center portion which couples across said slot, thereby parasitically coupling said slot to said dipole; and



means for affixing said parasitic Z-shaped dipole to said mast at circumferentially spaced points thereon remote from said slot.

4,899,166

SELF PROTECTED AND TRANSPORTABLE FLAT LATTICE ANTENNA

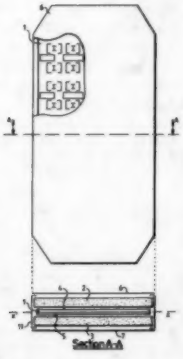
Alain Menestreau, Saintry S/Seine; Maurice Marchand, Sevran; Alain Cornu, Cachan, and Richard Le Brun, Malakoff, all of France, assignors to IMT Radio Professionnelle, Boulogne Billancourt, France

Filed Apr. 5, 1988, Ser. No. 177,977

Claims priority, application France, Apr. 10, 1987, 87 05106

Int. Cl.[4] H01Q *1/42*

U.S. Cl. 343—873 **9 Claims**



1. A flat, self protected and transportable lattice antenna comprising:

a flat three-plate line radiating structure,

a foam sheet, having a different thermal expansion coefficient than said flat three-plate line radiating structure, bonded to each face of the radiating structure by an adhesive which allows the radiating structure to slide with respect to the foam, and

a thin rigid plate bonded to each said foam sheet.

4,899,167

COLLAPSIBLE ANTENNA

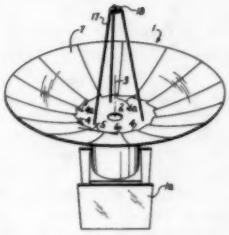
Manfred Westphal, Bermatingen, Fed. Rep. of Germany, assignor to Dornier System GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Jun. 26, 1987, Ser. No. 67,728

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1986, 3621578

Int. Cl.[4] H01Q *15/20*

U.S. Cl. 343—915 **3 Claims**



1. A foldable and deployable antenna reflector comprising:

a central panel being a part of the antenna and participating in reflection, the panel having along its circular periphery a circular-sawtooth shaped contour with ramplike edges separated by radial cut backs; and

a plurality of similar, rigid reflector panel segments forming the antenna reflector corresponding in number and width to the number and width of the ramplike sawtooth edges, each segment having a foot edge respectively hinged by means of two, single hinge axis hinges to the ramplike sawtooth edges, the singe axis running at least near parallel to these ramplike sawtooth edges.

4,899,168

OPTICAL RECORDING MEDIUM

Yoichi Osato, Yokohama; Ichiro Saito, Kawasaki, and Yoshio Takasu, Tama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 946,622, Dec. 29, 1986, abandoned, which is a division of Ser. No. 749,116, Jun. 26, 1985, abandoned, which is a continuation of Ser. No. 563,585, Dec. 20, 1983, abandoned. This application Aug. 25, 1988, Ser. No. 236,306

Claims priority, application Japan, Dec. 21, 1982, 57-224384

Int. Cl.[4] G01D *9/00*

U.S. Cl. 346—1.1 **13 Claims**

1. A method for preparing a laser beam-readable optical recording medium comprising:

providing a medium including a substrate having thereon a thin film containing a sulfur compound and a substance capable of undergoing a change in reflectivity through the absorption of electromagnetic radiation; and

irradiating said medium with an electromagnetic radiation beam which is sufficient to form on said thin film, pitted sections having higher reflectivity than unpitted sections of said medium surrounding said pitted sections but is insufficient to cause depressions or to create holes in said thin film.

4,899,169

IMPRINTING APPARATUS

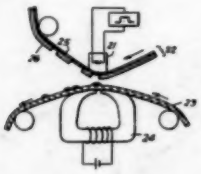
Katsumori Takei, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Continuation of Ser. No. 841,925, Mar. 20, 1986, Pat. No. 4,769,649. This application Feb. 22, 1988, Ser. No. 222,450

Claims priority, application Japan, Mar. 22, 1985, 60-57960; Mar. 22, 1985, 60-57961; Mar. 22, 1985, 60-57962

Int. Cl.[4] G01D *15/00*

U.S. Cl. 346—742 **9 Claims**



1. A thermoplastic magnetic ink medium comprising a heat-resistance support and a thermoplastic magnetic ink layer containing ferromagnetic fine particles disposed on the support and wherein said ink layer has an uneven surface.

4,899,170

SELECTIVE ENERGIZATION OF THERMAL PRINTERS

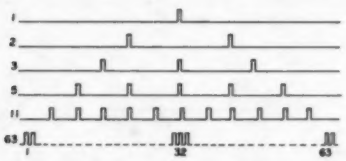
Masaki Izumi, Tokyo, Japan, assignor to Eastman Kodak Company, Rochester, N.Y.

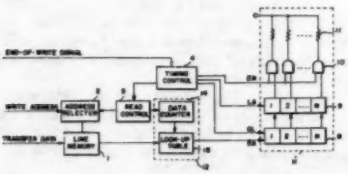
Filed Dec. 22, 1988, Ser. No. 288,316

Claims priority, application Japan, Dec. 22, 1987, 62-324261

Int. Cl.[4] G01D *15/10*

U.S. Cl. 346—76 PH **2 Claims**





1. A head driving device for a continuous thermal transfer printer, comprising:

a driving circuit for selectively turning on and off a plurality of heating resistors incorporated in a thermal transfer printer head a number of times during a pixel time interval having a midpoint, the number of on times of each heating resistor corresponding to density gradation data associated with each pixel of a line in an image to provide a desired density gradation for such image pixel; and

said driving circuit including means for turning on and off each heating resistor at times uniformly and symmetrically distributed in time about the midpoint of each pixel time interval.

4,899,171

THERMAL PRINTER

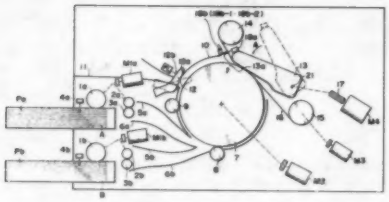
Tokihiko Ogura; Yoshiyuki Mizoguchi; Keiichi Ikeda, all of Yokohama, and Tomishige Taguchi, Urawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 2, 1988, Ser. No. 266,070

Claims priority, application Japan, Nov. 5, 1987, 62-278177

Int. Cl.[4] G01D *15/10*; B41J *11/50*

U.S. Cl. 346—76 PH **13 Claims**



1. A thermal printer for recording an image on a recording medium, comprising:

a first supply means for supplying a first recording medium;

a second supply means for supplying a second recording medium different from said first recording medium;

image processing unit having a memory means for storing inputted black-and-white image information and an inputted color image information;

an inked sheet having a plurality of colors, for recording a color image on said first recording medium;

a recording means for recording images on said first recording medium and on said second recording medium; and

a control means for operation of said first or second supply means and of said inked sheet, in accordance with conditions whether a black-and-white image stored in said memory means is to be recorded or whether a color image stored in said memory means is to be recorded.

4,899,172

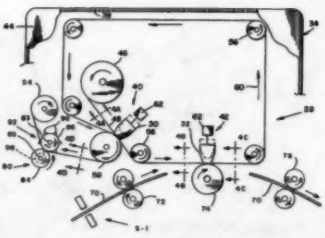
METHOD AND APPARATUS FOR PERFORATING INDICIA ON USED THERMAL TRANSFER RIBBON WITHIN A CASSETTE

William Berson, Westport; Julius Gluck, Norwalk; Patrick Murphy, Stamford; Christopher D. Smith, New Milford, and Duc H. Tran, Bridgeport, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 28, 1987, Ser. No. 138,425

Int. Cl.[4] G01D *15/10*; B41J *32/00, 33/02*

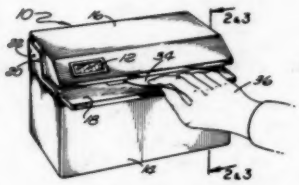
U.S. Cl. 346—76 PH **21 Claims**



1. In printing apparatus of the type which includes a cassette, a ribbon in the cassette, and means for thermally transferring ink from the ribbon to a workpiece, wherein the ribbon includes a backing layer and an ink donor layer, a printing process comprising the steps of:

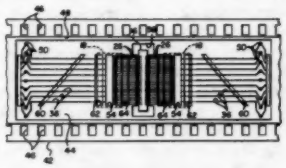
(a) transferring ink from the ink donor layer to the backing layer;
(b) perforating the inked backing layer within the cassette; and
(c) sensing step (b).

4,899,173
TIME CLOCK DEVICE
Jack L. Elliano, North Hollywood, Calif., assignor to Electra Print Time Recorder Company, Hollywood, Calif.
Filed Apr. 20, 1988, Ser. No. 183,925
Int. Cl.[4] G01D *15/10;* **G06K** *7/10;* **B41J** *29/38;* **B41F** *1/00*
U.S. Cl. 346—82 **5 Claims**



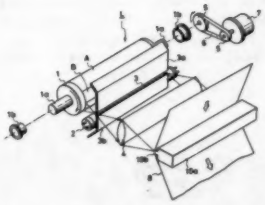
1. A time clock device for use with a time card comprising a clock, a time display, a thermal print head hving a plurality of print segments adapted to print upon thermographic paper, said thermal print head being located in a rotatable lid, said lid having a time card shelf, driver means to simultaneously actuate a selection of said print segments upon insertion of the time card and rotation of the shelf to a closed position.

4,899,174
METHOD OF MAKING LED ARRAY PRINTHEAD WITH TAB BONDED WIRING
David A. Newman, Rochester; William R. Laubengayer, Holley, and William B. Scott, Jr., Bergen, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Division of Ser. No. 228,641, Aug. 5, 1988, Pat. No. 4,851,862. This application Jun. 30, 1989, Ser. No. 373,971
Int. Cl.[4] G01D *9/42, 15/06, 9/00*
U.S. Cl. 346—107 R **2 Claims**



1. The method of making a module for an LED printhead having a plurality of LED array modules mounted end-to-end on a support member, each of said LED array modules comprising an LED array chip connected along each edge to one edge of a corresponding one of two control chips, and circuit board means carried by said support means and connected to the other edges of said control chip, said method comprising:
(a) preparing a TAB frame comprising a sheet of insulative plastic material supporting multiple internal conductive wires arranged to electrically connect an LED array chip to said two control chips spaced from said array chips at opposite sides thereof and multiple external conductive wires arranged to connect with opposite edges of said control chips and for subsequent connection with said circuit board means;
(b) providing windows in said TAB frame surrounded by said plastic material to respectively receive said LED array chip and said two control chips at opposite sides of said LED array chip and to expose those portions of said multiple conductive wires overlying the edges of said chips received in said windows and those portions of said wires connected to said control chip which are subsequently connected to said circuit board means;
(c) positioning said chips in respective ones of said openings and bonding the adjacent exposed conductive wire portions to said chips;
(d) electrically testing the testable module so fabricated on said TAB frame by means of said conductive wires; and
(e) cutting said TAB frame to remove excess material and thereby provide an excised assembly module with said LED diode array located transversely across the center region thereof and extending at both sides slightly beyond the corresponding edges of the plastic material comprising the unsupported LED array module.

4,899,175
RECORDING SYSTEM WITH ILLUMINATION MEANS UTILIZING A PLURALITY OF FLUORESCENT SUBSTANCES
Toshiaki Harada; Tadashi Yamamoto, both of Kawasaki, and Masanori Takenouchi, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 41,043, Apr. 21, 1987, abandoned. This application Nov. 5, 1987, Ser. No. 116,789
Claims priority, application Japan, Apr. 24, 1986, 61-93368; Sep. 11, 1986, 61-212802; Sep. 11, 1986, 61-212803; Sep. 24, 1986, 61-223726; Nov. 27, 1986, 61-280738
Int. Cl.[4] G01D *15/14;* **H04N** *1/23, 1/46*
U.S. Cl. 346—108 **12 Claims**



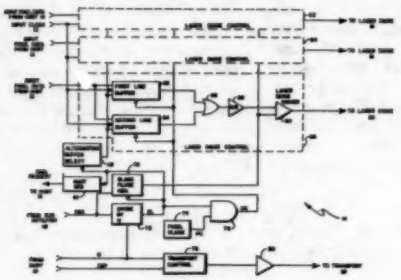
1. A recording system adapted for recording an image on a subject comprising:
a recording section having illumination means for imparting light energy to an image forming member; and
a transfer section for transferring onto a recording medium the image which is formed on said image forming member,
said illumination means including:
a plurality of fluorescent substances each having a different spectral characteristic, with said fluorescent substances being disposed in different planes;
drive means capable of repeatedly positioning said plurality of fluorescent substances at a predetermined position; and
a light source for illuminating said predetermined position to cause said fluorescent substances located at said predetermined positioned to emit light.

4,899,176
METHOD OF REDUCING AVERAGE DATA RATE IN ROTATING MIRROR LASER RECORDER
John M. McQuade, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Aug. 25, 1988, Ser. No. 236,463
Int. Cl.[4] G01D *9/42;* **G02B** *26/08;* **H04N** *1/23*
U.S. Cl. 346—108 **9 Claims**

1. Apparatus for recording an image on a medium as a function of digital pixel data, the apparatus comprising:

first and second buffer means for receiving and accumulating pixel data at a first rate and for supplying the pixel data to the means for modulating at a second higher rate; and

select means for alternately selecting one of the first and second buffer means to receive and accumulate pixel data for one scan line and the other of the first and second



buffer means to supply pixel data for another scan line to the means for modulating;

means for scanning a radiation beam across the medium in a first direction using non-successive facets of a multifaceted rotating mirror; and

means for modulating the beam as a function of the pixel data accumulated to record the scan line on the medium.

4,899,177

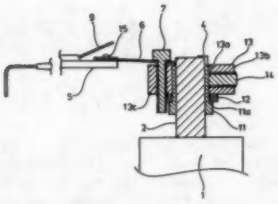
STRUCTURE FOR INSTALLING A RECORDING PEN

Tsuguharu Hosoya, Ichikawa, Japan, assignor to 501 Nihon Kohden Corporation, Tokyo, Japan

Filed Feb. 1, 1989, Ser. No. 305,389

Int. Cl.[4] G01D *15/16*

U.S. Cl. 346—139 R **2 Claims**



1. A structure for installing a recording pen, in which a proximal end of a recording pen for recording a measured waveform on a sheet of recording paper is secured to a drive shaft of a driving source for oscillating said recording pen, said structure comprising:

a cylindrical spacer fitted about and secured to said drive shaft and having a step portion formed at one end of said cylindrical spacer, said cylindrical spacer having an axial direction and an outer peripheral portion;

packing formed of a resilient material having an upper surface and an outer side portion and being fitted about said outer peripheral portion of said cylindrical spacer, and abutting against said step portion in said cylindrical spacer;

a pen-holder fitted about said outer peripheral portion of said cylindrical spacer and abutting against said upper surface of said packing;

an installation screw being screwed in said pen-holder perpendicularly to said axial direction of said cylindrical spacer, and being adapted to secure said pen-holder to said cylindrical spacer; and

an adjustment screw having a distal end, said adjustment screw being screwed into said pen-holder to which said proximal end of said recording pen is secured, and passing through said pen-holder in a direction parallel to said axial direction of said cylindrical spacer, said distal end of said adjustment screw pressing against said outer side portion of said packing so as to provide frictional interengagement between said distal end of said adjustment screw and said outer side portion of said packing.

4,899,178

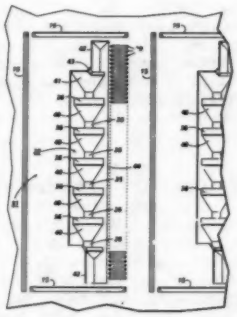
THERMAL INK JET PRINTHEAD WITH INTERNALLY FED INK RESERVOIR

Thomas A. Tellier, Williamson, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 2, 1989, Ser. No. 305,041

Int. Cl.[4] G01D *15/16*; B41J *3/04*

U.S. Cl. 346—140 R **5 Claims**



1. An improved thermal ink jet printhead of the type formed by the mating and bonding of first and second substrates, the first substrate being silicon and having anisotropically etched in one surface thereof a through recess and a plurality of parallel, elongated grooves, the second substrate having a plurality of heating elements and addressing electrodes patterned on one surface thereof, the through recess serving as an ink reservoir with its open bottom serving as an ink inlet and the elongated grooves serving as ink channels, one end of which is open to serve as ink droplet emitting nozzles, each heating element being located in a respective one of the ink channel grooves a predetermined distance upstream from the nozzles, and said printhead having means to place the ink channel grooves into communication with the through recess, so that selective application of electrical pulses representing digitized data to the heating elements eject and propel ink droplets from the nozzles to a recording medium, wherein the improvement comprises:

said ink reservoir being produced by patterning vias in an etch resistant mask on a surface of the first substrate and anisotropically etching for a predetermined time period the first substrate to provide a linear series of individual through recesses and at least one outer shallow, V-groove recess on each of the outer ends of the series of through recesses, so that the ink reservoir is segmented; and

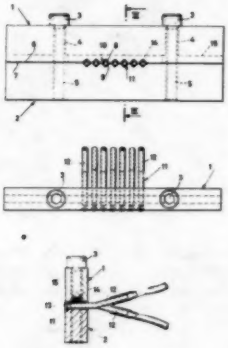
means for placing the through recesses and V-groove recesses into communication with each other, so that the V-groove recesses are internally fed from the through recesses of the segmented reservoir.

4,899,179

NOZZLE SUPPORT HEAD FOR INK-JET MARKING DEVICES

Augusto Marchetti, Piazza Sicilia, 7, 20146 Milano, Italy

Filed Feb. 21, 1989, Ser. No. 312,944
Claims priority, application Italy, Feb. 29, 1988, 19579 A/88
Int. Cl.[4] G01D *15/18*; B05B *15/06*
U.S. Cl. 346—140 R **5 Claims**



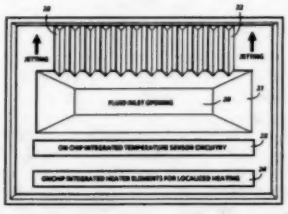
1. Nozzle support head for ink-jet marking devices, characterized in that it is accomplished in two superimposed pieces which can be fastened and released, mating along respective faces provided with respective successions of notches which together with the corresponding notches in the mating face of the other piece define a succession of holes to house respective ink atomizers.

4,899,180

ON CHIP HEATER ELEMENT AND TEMPERATURE SENSOR

Abdul M. Elhatem, Hawthorne, and Steven A. Buhler, Redondo Beach, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 29, 1988, Ser. No. 187,779
Int. Cl.[4] G01D *18/00*; B41J *3/04*
U.S. Cl. 346—140 R **2 Claims**



1. A thermal ink jet array device formed on a silicon substrate comprising:

an array of ink jet channels,

an ink inlet,

connecting means for allowing ink to flow from said inlet to said ink jet channels,

a sensor means for sensing the temperature of said device and for outputting a signal which is a function of the device temperature, said sensor means comprising a temperature sensing element, and a differential amplifier for outputting said signal which is a function of the temperature sensed by said sensing element, and

means for heating coupled to said signal for heating said device,

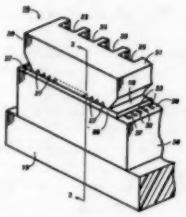
said channels, inlet and connecting means being cavities etched into said silicon substrate, and said sensor means and means for heating being integrated on said silicon substrate.

4,899,181

LARGE MONOLITHIC THERMAL INK JET PRINTHEAD

William G. Hawkins, Webster, and Donald J. Drake, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 30, 1989, Ser. No. 303,620
Int. Cl.[4] G01D *15/16*; B41J *3/04*
U.S. Cl. 346—140 R **4 Claims**



1. An improved thermal ink jet printhead of the type formed by the mating and bonding of first and second substrates, the first substrate being silicon with {100} crystal plane surfaces and having anisotropically etched in one surface thereof a reservoir and a plurality of parallel, elongated ink channels grooves, the second substrate having a plurality of heating elements and addressing electrodes patterned on one surface thereof, and the elongated ink channel grooves having one end adjacent the ink reservoir and opposite end open to serve as ink droplet emitting nozzles, each heating element being located in a respective one of the ink channel grooves a predetermined distance upstream from the nozzles, and said printhead having means to place the ink channel grooves into communication with an ink supply, so that selective application of electrical pulses representing digitized data to the heating elements eject and propel ink droplets from the nozzles to a recording medium, wherein the improvement comprises:

said ink reservoir being segmented by dividing walls to provide a segmented reservoir in which each segment of the reservoir is isolated from each other, the segmented reservoir being produced by patterning an etch resistant mask and anisotropically etching a linear series of separate through recesses, adjacent through recesses being separated by dividing walls in which opposing wall surfaces are in separate segments, the dividing walls strengthening the printhead when the number of nozzles and thus the length of the reservoir are increased and reducing the effects of angular misalignment between mask and first substrate crystal planes.

4,899,182

ELECTROPHOTOGRAPHIC IMAGE FORMING APPARATUS

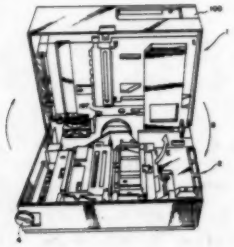
Motoichiro Inoue, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 15, 1988, Ser. No. 244,910

Claims priority, application Japan, Sep. 18, 1987, 62-142884[U]; Sep. 18, 1987, 62-142887[U]; Sep. 18, 1987, 62-142886[U]; Sep. 18, 1987, 62-142885[U]; Jun. 15, 1988, 63-147578

Int. Cl.[4] G01D *15/00*

U.S. Cl. 346—153.1 15 Claims



1. An electrophotographic image forming apparatus comprising;

scanning means for optically scanning an image on a document;

sheet feed means for feeding a sheet to be printed;

image forming means for forming an image data to be printed from a scanned image;

printing means for printing the image data on the sheet fed by the sheet feed means;

sheet ejecting means for ejecting a printed sheet to an ejection tray;

controller means for controlling the scanning means, sheet feed means, image-forming means, printing means and sheet ejecting means so as to carry out a sequence of a printing operation;

a housing for accommodating the scanning means, sheet feed means, image forming means, printing means, and the sheet ejecting means; and

a controller cartridge detachably accommodated in a space formed into the housing for accommodating the controller means.

4,899,183

IMAGE FORMING APPARATUS

Hirohisa Kitano; Itaru Saito; Ken Matsubara; Kouichi Shingaki, and Tomohiko Masuda, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 7, 1989, Ser. No. 307,738

Claims priority, application Japan, Feb. 8, 1988, 63-26754

Int. Cl.[4] G01D *15/00*

U.S. Cl. 346—154 7 Claims

1. An image forming apparatus comprising:

an optical shutter array having a plurality of optical shutters constructed of material possessing electro-optical effects;

polarizing member provided on the entering light side of the optical shutter array;

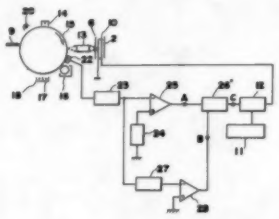
analyzing member provided on the exiting light side of the optical shutter array;

actuation voltage impression means for applying an actuation voltage to the optical shutter array based on image signals;

a photosensitive member on which an electrostatic latent image is formed by exposure to light transmitted through the optical shutter array;

detecting means for detecting a decayed surface potential of the photosensitive member induced by light exposure;

compensating means, when the detected value by the detecting means is greater than a predetermined reference value, for changing the actuation voltage applied to the optical



shutters until said detected value is less than the reference value; and

control means, upon detection of the detected value to be less than said reference value, for setting the compensated voltage as a compensated actuation voltage to be applied to the optical shutter array.

4,899,184

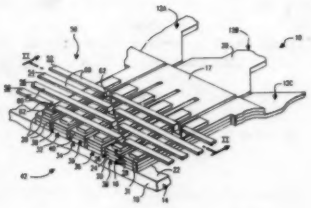
MULTIPLEXED THIN FILM ELECTROLUMINESCENT EDGE EMITTER STRUCTURE AND ELECTRONIC DRIVE SYSTEM THEREFROM

David Leksell, Oakmont, and Juris A. Asars, Murrysville Boro, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 24, 1989, Ser. No. 343,697

Int. Cl.[4] G01D *15/00*

U.S. Cl. 346—155 16 Claims



1. A thin film electroluminescent (TFEL) edge emitter structure, comprising:

a substrate layer;

a plurality of TFEL assemblies disposed on said substrate layer, each said TFEL assembly including a first layer of electrically conductive material, a second layer of electrically conductive material spaced from said first layer of electrically conductive material and an electrically energizable, light-emitting composite layer interposed therebetween;

at least the second electrically conductive layer of each TFEL assembly being segmented to form a plurality of second electrically conductive elements, said plurality of second electrically conductive elements in combination with said first electrically conductive layer and said electrically energizable, light-emitting composite layer forming a pixel group including a plurality of individual light-emitting pixels; and

the portion of the light-emitting, composite layer associated with an individual pixel of a particular pixel group being operable to emit light energy at a light-emitting edge

surface of said pixel upon the application of a first electrical signal to said first electrically conductive layer common to each said pixel of said particular pixel group and a second electrical signal to said individual pixel second electrically conductive element.

4,899,185

HIGH DENSITY TAPE-AUTOMATED BONDING (TAB) OF ELECTRONIC COMPONENTS

David A. Newman, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 24, 1989, Ser. No. 397,816
Int. Cl.[4] G01D *15/00*
U.S. Cl. 346—155 **5 Claims**

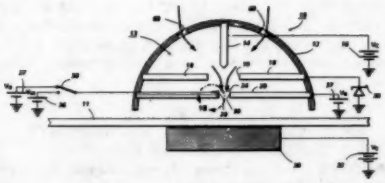
1. An electronic assembly including two electronic devices provided with mutually corresponding, narrowly spaced, generally parallel first and second alternating electrodes provided with respective bonding pads, said bonding pads of said first electrodes of each device being aligned in a first row near one edge thereof and bonding pads of said second electrodes being aligned between said alternate electrodes in a second row farther from said edge, and, first and second superimposed mutually separated layers of spaced bonding wires, said wires of said first layer connecting said first electrodes of one of said devices to corresponding first electrodes of the other of said devices, said wires of said second layer being longer than said wires of said first layer and connecting said second electrodes of one of said devices to the corresponding second electrodes of the other of said devices.

4,899,186

IONOGRAPHIC DEVICE WITH PIN ARRAY CORONODE

Billy D. Walcott, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 19, 1989, Ser. No. 367,917
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—159 **17 Claims**



1. An ionographic imaging device, for depositing charge in imagewise configuration of an imaging surface moving in a process direction, comprising:

a support member;

a pin array coronode supported on the support member and positioned transverse to the process direction, having an array of projections directed towards the imaging surface, and coupled to a coronode power supply suitable to drive the coronode to a corona producing condition to produce a supply of ions directed toward the imaging surface;

a corona controlling grid member, supported on the support member, and arranged between the pin array coronode and the imaging surface, and biased to a selected grid voltage level, the grid member formed to provide an opening therethrough, through which ions generated at the pin array coronode pass;

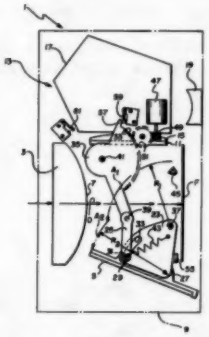
an array of control electrodes supported on an array substrate and positioned transverse to the process direction, in generally parallel opposition to a conductive member, the substrate and the conductive member supported on the support member with respect to each other to form an ion modulation path therebetween, through which ions generated at the pin array coronode pass, each control electrode of the array connected to an imaging control power supply and individually biasable to a selected electrode voltage level with respect to a reference voltage, whereby the passage of ions through the ion modulation path, past the array of control electrodes to the imaging surface, is controlled.

4,899,187

MIRROR SYSTEM FOR A SINGLE LENS REFLEX CAMERA

John H. Alligood, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 12, 1989, Ser. No. 364,918
Int. Cl.[4] G03B *19/12*
U.S. Cl. 354—152 **5 Claims**



1. An improved single lens reflex camera wherein (a) a unitary mirror can be positioned in a light-reflecting position between the rear of a taking lens and the film to reflect the rays of light that come through said lens on to a focusing screen of a viewfinder, and can be positioned in a non-reflecting position substantially facing the bottom of said camera to allow the rays of light that come through the lens to expose the film, and (b) supporting means supports said mirror to pivot about two axes, forward toward the rear of said lens and downward to at least partially underneath the film, from the light-reflecting position to the non-reflecting position, and wherein the improvement comprises:

said supporting means includes compound motion means for enabling said mirror to pivot first only about one of said axes then only about the other axis; and

change-over means cooperates with said compound motion means for effecting a change-over of mirror movement from about one of said axes to about the other axis.

4,899,188

LIGHT SCATTERING OPTIC GUIDE

Maurice Lecover, 142 S. Kilkea Dr., Los Angeles, Calif. 90048

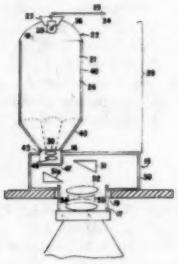
Filed Jan. 3, 1989, Ser. No. 294,263
Int. Cl.[4] G03B *29/00*
U.S. Cl. 354—75 **12 Claims**

1. For use in a photorecorder in which a camera having an

eyepiece, an internal focusing reticle and an image lens is supported in relation to a baseboard surface which supports a to-be-photographed object, a light scattering optic guide comprising:

a light source;

a light coupler formed of a transparent material having a



generally cylindrical portion having an external surface, an entrance surface coupled to said light source, an exit surface coupled to said eyepiece and a plurality of facets arranged to transition said cylindrical portion to said exit surface; and

a reflective coating formed on said exterior surface of said cylindrical portion and said plurality of facets.

4,899,189

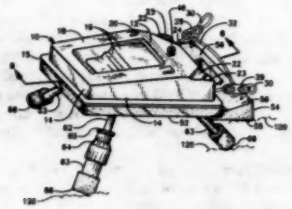
SUPPORT AND PROTECTIVE BASE DEVICE FOR CAMERA

George E. Frost, 6535 S. Race Cir. E., Littleton, Colo. 80121

Filed Oct. 31, 1988, Ser. No. 265,417

Int. Cl.[4] G03B *17/00*

U.S. Cl. 354—293 **20 Claims**



1. A lightweight base device for stabilization and protection of a camera or the like in freestanding, transporting or hand held configuration, comprising;

a structural shell body member comprising a camera platform having a hole for a camera interface screw for secure mounting to a camera, ribs at each side of a depressed trough extending forward and downward from the said camera body platform, and supporting shell walls extending downward from said platform and said ribs to a base rim.

4,899,190

ZOOMING OPTICAL SYSTEM CONTROL DEVICE

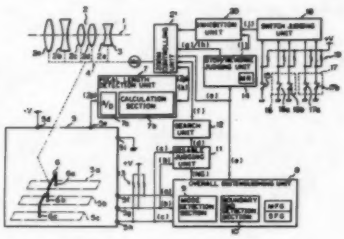
Daisuke Hata, Funabashi, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed May 31, 1988, Ser. No. 200,459

Claims priority, application Japan, May 31, 1987, 62-136634; Jun. 2, 1987, 62-137681; Jun. 2, 1987, 62-138568

Int. Cl.[4] G03B *3/10, 5/00, 17/04, 15/22*

U.S. Cl. 354—400 **6 Claims**



1. A zooming optical system control device for controlling the setting of a zooming optical system to one of a plurality of regions such as a zooming region wherein said optical system ensures zooming photographing, a macro region wherein said optical system ensures macro photographing and a containment region wherein said optical system is contained into a predetermined position, said optical system comprising a zooming lens group, a macro lens group and a focusing lens group each disposed on one identical optical axis,

said control device comprising;

(a) a generating means for generating a distinguishing information representing said one of a plurality of regions wherein said optical system is situated and for generating a disable information representing that said optical system is situated in a non-distinguishable region in which said generating means can not distinguish a region wherein said optical system is situated in a case where said optical system is situated in said non-distinguishable region,

(b) an instructing means for instructing a setting region whereto said optical system is to be set,

(c) a driving means for driving said optical system in order to set said optical system to said setting region, and

(d) a control means for controlling said driving means in such a manner that said driving means drives said optical system to said setting region and drives said optical system toward said one of a plurality of regions when said generating means generates said disable information.

4,899,191

EXPOSURE CONTROL APPARATUS FOR LENS-SHUTTER TYPE CAMERA

Atsushi Maruyama, Yokohama, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 27, 1989, Ser. No. 316,504

Claims priority, application Japan, Mar. 10, 1988, 63-55011; Mar. 22, 1988, 63-65905

Int. Cl.[4] G03B *7/097, 17/16, 15/03, 5/00*

U.S. Cl. 354—421 **10 Claims**

1. An exposure control apparatus for a lens-shutter type camera having a lens whose focal length can be varied and shutter blades whose aperture size in a full-open state changes in accordance with a change in the focal length of the lens and which serve as an aperture, comprising:

first table means for storing a correspondence between a luminance of an object to be photographed and a shutter-blade aperture time at a specific focal length;

second table means for storing a correspondence between

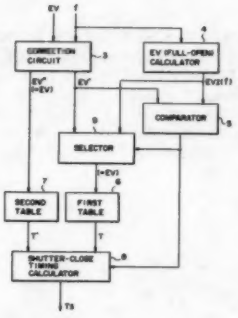
the luminance of the object and an effective exposure time at the specific focal length;

correction means for correcting the luminance of the object in accordance with a difference between the specific focal length and the focal length of said lens for said first and second table means, respectively, so as to calculate first and second corrected luminance;

full-open luminance calculating means for calculating, in accordance with the focal length of said lens, a full-open luminance as the luminance of the object with which said shutter blades are fully opened;

determination means for comparing the first corrected luminance and the full-open luminance to determine whether correct exposure can be obtained before or after said shutter blades are fully opened;

supply means for supplying the first corrected luminance or the full-open luminance to said first table means in accordance with an output from said determination means, said supply means supplying the first corrected luminance to said first table means when said determination means



determines that correct exposure is obtained before the shutter blades are fully opened, and supplying the full-open luminance to said first table means when said determination means determines that correct exposure is obtained after the shutter blades are fully opened; and

control means for controlling a shutter-blade close timing by outputs from said first and second table means in accordance with an output from said determination means, said control means determining a close timing using the shutter-blade aperture time output from said first table means on the basis of the first corrected luminance when said determination means determines that correct exposure is obtained before the shutter blades are fully opened, and determining a close timing using a sum of the effective exposure time output from said second table means on the basis of the second corrected luminance and a half of the shutter-blade aperture time output from said first table means on the basis of the full-open luminance when said determination means determines that correct exposure is obtained after the shutter blades are fully opened.

4,899,192

IMAGE INFORMATION APPARATUS

Yukitoshi Fujita, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 13,916, Feb. 12, 1987, abandoned. This application May 26, 1988, Ser. No. 203,540

Claims priority, application Japan, Feb. 18, 1986, 61-34261

Int. Cl.[4] G03B *27/48, 27/50, 27/70*

U.S. Cl. 355—51 **6 Claims**

1. An image formation apparatus comprising

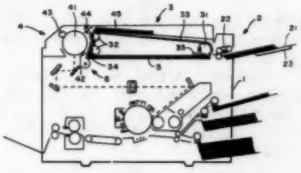
a housing,

an optical system,

an automatic document feeder with a document supplying section at one end in the upper part of said housing,

an automatic document winding device at the other end of said housing with a drum for wrapping a document thereabout,

a document size sensor for detecting the size of a document supplied from said document supplying section relative to the size of said drum, and



selecting means capable of automatically selecting on the basis of document size detected by said document size sensor between a first mode of operation wherein a document is transported by said automatic document feeder and said optical system is moved to scan said document and a second mode of operation wherein a document is transported by said automatic document winding device and wherein said optical system remains fixed and said drum is rotated to scan said document.

4,899,193

IMAGE RECORDING APPARATUS HAVING ADJUSTABLE OPTICAL SYSTEM

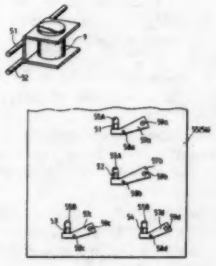
Yoichi Horaguchi, Nagoya; Takashi Tomizawa, Aichi; Shigeyuki Hayashi, Nagoya; Motoshi Ohno, Nagoya, and Takashi Nakata, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Dec. 8, 1988, Ser. No. 281,336

Claims priority, application Japan, Dec. 11, 1987, 62-189349[U]

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—55 **5 Claims**



1. An image recording apparatus for forming an image on an image recording medium, which image corresponds to an image of an original comprising:

a casing;

a light source disposed in said casing;

an exposure unit at which said image recording medium is exposed to light reflected at said original to form a latent image on said image recording medium;

optical components for directing light from said light source and reflected at said original toward said exposure unit, said optical components being accommodated in said casing;

supporting means for supporting said optical components

within said casing, said supporting means being disposed in said casing and parts of said supporting means extending through said casing toward outside; and

adjusting means for moving said supporting means within said casing, said adjusting means being disposed outside said casing and engageable with said parts of said supporting means.

4,899,194

METHOD OF AND DEVICE FOR DETECTING IMAGE

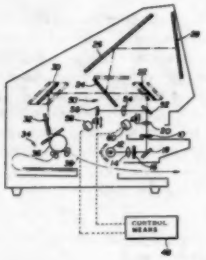
Hisamitsu Hori, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 22, 1988, Ser. No. 274,544

Claims priority, application Japan, Nov. 24, 1987, 62-293960; Jan. 14, 1988, 63-004659

Int. Cl.[4] G03B *27/34*

U.S. Cl. 355—56 **10 Claims**



1. In the method of detecting an image in an auto-focusing apparatus in which a projection lens is controlled to focus the image by scanning the light projecting through the original image with an image sensor and by utilizing the image signals generated from said image sensor, an improvement which comprises:

(a) the step of making a histogram which represents the number of picture elements in relation of the image signal values sensed by said image sensor in one focus zone;

(b) the step of judging whether or not an image is present in said one focus zone on the basis of a profile of said histogram;

(c) the step of setting a binarization level using said histogram when it is judged that no image is present at the preceding step (b);

(d) the step of counting the reversing number N of which the image signals of another focus zone change from a value under/over said binarization level to a value over/under said binarization level; and

(e) the step of judging that an image is present in said another focus zone when the image reversing number N counted at the preceding step (d) is equal to or more than a programmed number M.

4,899,195

METHOD OF EXPOSING A PERIPHERAL PART OF WAFER

Manabu Gotoh, Yokohama, Japan, assignor to Ushio Denki, Tokyo, Japan

Filed Dec. 21, 1988, Ser. No. 287,793

Claims priority, application Japan, Jan. 29, 1988, 63-17286; Sep. 9, 1988, 63-224531

Int. Cl.[4] G03B *27/32*

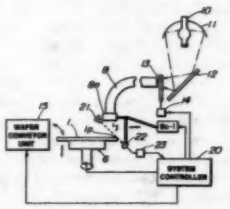
U.S. Cl. 355—77 **2 Claims**

1. A method of exposing a peripheral part of wafer which comprises,

turning a wafer on which photoresist coated,

exposing a peripheral part of said wafer to light guided by optical fiber lightguide,

detecting the edge of said wafer by sensor,



and controlling the light emission end of said optical fiber lightguide to expose a fixed distance from the edge of said wafer according to signal from said sensor.

4,899,196

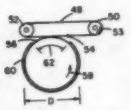
COPY APPARATUS HAVING A NON-INTEGRALLY SIZED TRANSFER DEVICE

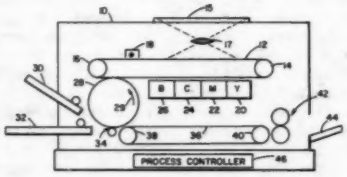
Gregory P. Mahoney, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 275,828, Nov. 25, 1988, abandoned. This application Feb. 22, 1989, Ser. No. 313,678

Int. Cl.[4] G03G *15/00, 15/01*

U.S. Cl. 355—271 **15 Claims**





1. Copy apparatus for placing final images onto flat sheets, with the final images consisting of a plurality of intermediate images, said apparatus comprising:

an image carrying surface arranged in the form of an endless belt containing a seam across the surface of the belt;

means for placing a plurality of toned intermediate images onto the image carrying surface;

a continuous, non-seamed surface closely positioned to said image carrying surface;

means for transferring the intermediate images from the image carrying surface to the continuous surface in registration to form a final image, and for transferring the final image on the continuous surface to a flat sheet, said continuous surface being arranged to include at least one frame area for accepting the transferred image and at least one interframe area; and

means for controlling the movement of said two surfaces such that the seam of the image carrying surface precesses

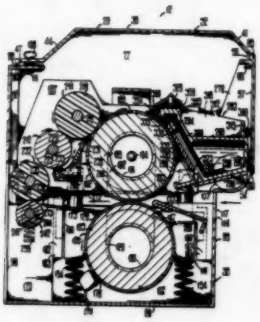
through the interframe area of the continuous surface during the plurality of intermediate image transfers between the two surfaces.

4,899,197

FUSER FOR USE IN AN ELECTROPHOTOGRAPHIC PRINT ENGINE

David R. Davis, Buford; Danny L. Slayton, Lilburn, and Raymond J. Shook, Lawrenceville, all of Ga., assignors to Colorocs Corporation, Norcross, Ga.

Filed May 17, 1988, Ser. No. 194,756
Int. Cl.[4] G03G *15/20*
U.S. Cl. 355—290 **12 Claims**



1. An improved fuser apparatus for fusing toner to an image receptor sheet in an electrophotographic print engine, the improved fuser apparatus comprising:

a fixing member having an outer surface;

a compression member having an outer surface contacting a portion of the outer surface of the fixing member;

means for moving the fixing member so as to draw a receptor sheet bearing toner between the fixing member and the compression member;

means for heating the fixing member so as to fuse toner to the image receptor sheet as the image receptor sheet is drawn between the fixing member and the compression member;

the outer surface of the fixing member and the outer surface of the compression member are substantially mutually compressible, so the image receptor sheet does not adhere to either the outer surface of the fixing member or the outer surface of the compression member as the image receptor passes between the fixing member and the compression member, and so the outer surface of the fixing member and the outer surface of the compression member conform to contours of the toner-laden image receptor sheet thereby providing a substantially uniform and thorough fusing of the toner to the image receptor sheet.

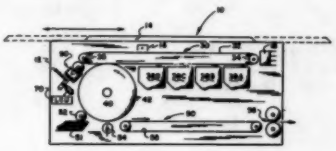
4,899,198

DUAL PURPOSE CLEANING APPARATUS

Gregory Mahoney, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 139,226, Dec. 29, 1987, abandoned. This application Sep. 20, 1988, Ser. No. 246,707
Int. Cl.[4] G03G *15/21*
U.S. Cl. 355—297 **10 Claims**

7. An electrostatographic copier or printer that forms toner particle images and transfers them to a copy sheet by utilizing a moving photoconductor and a moving intermediate image transfer member in image transfer relationship with the photoconductor, said copier or printer including a single cleaning apparatus having a cleaning element directly engageable against the surface of the photoconductor or against the surface of the intermediate image transfer member for removing



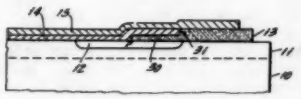
residual particles from said surface of the photoconductor and said surface of the intermediate image transfer member.

4,899,199

SCHOTTKY DIODE WITH TITANIUM OR LIKE LAYER CONTACTING THE DIELECTRIC LAYER

Herbert J. Gould, Sherman Oaks, Calif., assignor to International Rectifier Corporation, Los Angeles, Calif.

Filed Sep. 30, 1983, Ser. No. 537,509
Int. Cl.[4] H01L *29/48*
U.S. Cl. 387—15 **14 Claims**



1. A semiconductor device having a monocrystalline silicon substrate of one conductivity type and having at least one planar surface;

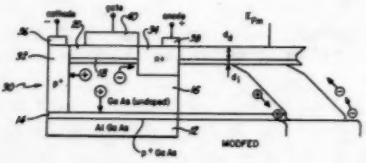
a planar junction of the opposite conductivity type formed in said planar surface and separating said planar surface into a first surface portion of said one conductivity type and a second surface portion of said opposite conductivity type; said planar junction forming a guard ring; a thin layer of dielectric material on said planar surface and extending across and passivating at least one portion of said planar junction and exposing at least a portion of the area of said first surface portion; a first metal layer in contact with at least a portion of said area of said first portion and forming a Schottky barrier therewith; said guard ring surrounding said barrier; said first metal layer being of a material characterized in having a relatively good adherence to said first portion of said silicon substrate and relatively poor adherence to the surface of said layer of dielectric material; and a second continuous metal layer overlying and physically contacting at least an outer portion of the upper surface of said first metal layer including the lateral periphery of said first metal layer, and extending beyond at least the outer peripheral portion of said first metal layer and contacting at least a portion of the upper surface of said dielectric layer; said second metal layer being characterized in having good adherence to said first metal layer and to said dielectric layer and defining a stepped field plate extending from said first metal layer, and over the surface of said dielectric layer.

4,899,200

NOVEL HIGH-SPEED INTEGRATED HETEROSTRUCTURE TRANSISTORS, PHOTODETECTORS, AND OPTOELECTRONIC CIRCUITS

Michael Shur, Golden Valley, Minn., and John G. Simmons, Amherst, Mass., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Jun. 3, 1988, Ser. No. 202,178
Int. Cl.[4] H01L *27/14*
U.S. Cl. 357—30 **15 Claims**



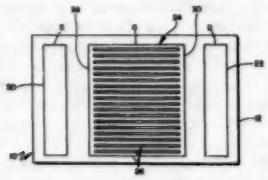
1. A planar photodetector comprising:
a bottom confinement layer of a first wider bandgap material;
a buried layer of a second narrower bandgap material overlying the bottom confinement layer, the buried layer having a first conductivity type;
a essentially undoped layer of the second material overlying the buried layer;
a top confinement layer overlying the undoped layer and having a wider bandgap than the second material;
a first contact region of first conductivity extending vertically through the top region and the relatively undoped layer to make electrical contact with the buried layer;
a second contact re$_2$ on of second conductivity type spaced laterally from the first contact region and extending vertically into the undoped layer, the second contact region being spaced from the buried layer;
first terminal means electrically connected to the first contract *r*egion; and
second terminal means electrically connected to the second contact region.

4,899,201

ELECTRONIC AND OPTOELECTRIC DEVICES UTILIZING LIGHT HOLE PROPERTIES

Jingming Xu, Toronto, Canada; Michael Shur, Golden Valley, Minn., and Mark Sweeny, Ossining, N.Y., assignors to Regents of the University of Minnesota, St. Paul, Minn.

Continuation of Ser. No. 85,908, Aug. 14, 1987, abandoned. This application May 31, 1989, Ser. No. 363,367
Int. Cl.[4] H01L *29/80*
U.S. Cl. 357—22 **7 Claims**



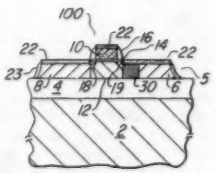
1. A semiconductor device comprising:
a body having a first surface;
a first p-type region in the body;
a second p-type region in the body spaced from the first p-type region;
a hole confinement region in the body generally parallel to the first surface, having a first end connected to the first p-type region and a second end connected to the second p-type region, the hole confinement region confining movement of holes in a direction generally perpendicular to the first surface; and
first gate means having a plurality of generally parallel conductive strips which are generally parallel to the first surface and extend in a direction from the first to the second p-type region for creating in the hole confinement region, as a function of an applied electric field, a plurality of generally parallel one-dimensional p-type conducting regions extending between the first and second p-type regions, wherein for each adjacent pair of the conductive strips, a one-dimensional p-type conducting region is induced.

4,899,202

HIGH PERFORMANCE SILICON-ON-INSULATOR TRANSISTOR WITH BODY NODE TO SOURCE NODE CONNECTION

Terence G. W. Blake, and Hsindao Lu, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 8, 1988, Ser. No. 216,933
Int. Cl.[4] H01L *27/12, 29/78, 29/06*
U.S. Cl. 357—23.7 **22 Claims**



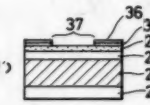
1. A transistor formed in a semiconductor layer overlying an insulating film, comprising:
a gate electrode overlying a body node portion of said semiconductor layer, said body node portion being of a first conductivity type and having first and second sides, said gate electrode overlying a surface of said semiconductor layer opposite said insulating film;
a drain region of said semiconductor layer, said drain region being of said second conductivity type and disposed adjacent a first side of said body node portion;
a source region of said semiconductor layer, said source region being of said second conductivity type and comprising:
a first portion adjacent a second side of said body node portion; and
a second portion adjacent said first portion, said second portion relatively heavily doped relative to said first portion;
a first contact region of said layer of said semiconductor layer, said first contact region being of said first conductivity type, disposed at said surface of said semiconductor layer between said first portion of said source region and said second portion of said source region in a direction perpendicular to said gate electrode, and having a depth deeper than said first portion of said source region so that said first contact region is in contact with said body node portion; and
a ohmic connection between said first contact region and said source region.

4,899,203

SEMICONDUCTOR MEMORY INTEGRATED CIRCUIT AND PROCESS OF FABRICATING THE SAME

Masayoshi Ino, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Dec. 5, 1988, Ser. No. 280,155
Claims priority, application Japan, Dec. 11, 1987, 62-312014
Int. Cl.[4] H01C 21/72
U.S. Cl. 357—23.6 14 Claims



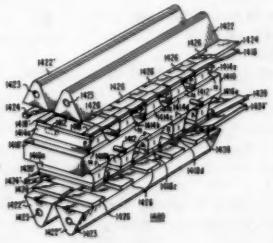
1. A semiconductor memory integrated circuit device having a stacked capacitor cell comprising:
(a) a semiconductor substrate;
(b) a first diffusion region, a channel region and a second diffusion region formed in the substrate;
(c) a gate insulating film and a gate electrode formed over the channel region;
(d) a first insulating film formed over said second diffusion region;
(e) a first plate electrode formed over said first insulating film;
(f) a second insulating film formed over said first plate electrode;
(g) a charge storage electrode formed over said second insulating film and having a part extending through a first contact hole, said first contact hole being provided through said first insulating film, said first plate electrode and said second insulating film, and said part extending through said first contact hole being arranged so as to contact said second diffusion region;
(h) a third insulating film formed over said charge storage electrode; and
(i) a second plate electrode formed over said third insulating film and having a part extending through a second contact hole, said second contact hole being provided through said second insulating film and said third insulating film, and said part extending through said second contact hole being arranged so as to contact said first plate electrode.

4,899,204

HIGH VOLTAGE SWITCH STRUCTURE WITH LIGHT RESPONSIVE DIODE STACK

Har'el Rosen, and Arye Rosen, both of Cherry Hill, N.J., assignors to General Electric Company, Morrestown, N.J.

Filed Dec. 1, 1987, Ser. No. 128,116
Int. Cl.[4] H01L 27/14
U.S. Cl. 357—30 12 Claims



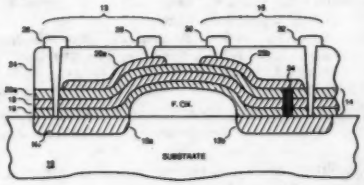
1. An electrical switch, device comprising:
a first PIN diode comprising a substantially intrinsic first semiconductor portion including mutually opposed first and second flat surfaces, said first semiconductor portion being doped near said first surface with one of N and P impurities, and near said second surface with the other one of said N and P impurities;
a second PIN diode comprising a substantially intrinsic second semiconductor portion including mutually opposed first and second flat surfaces, said second semiconductor portion being doped near said first surface with said one of said N and P impurities, and near said second surface with said other one of said N and P impurities, said first surface of said second semiconductor portion being electrical contact with said second surface of said first semiconductor portion for generating a physical stack of PIN diodes in which said PIN diodes are electrical connected in series, and poled for current flow in the same direction therethrough between said first surface of said first semiconductor portion and said second surface of said second semiconductor portion;
coupling means coupled to said first surface of said first semiconductor portion and to said second surface of said second semiconductor portion and adapted for coupling to a source of electrical potential, which includes a direct current component, associated with a load to be switched, in a manner which simultaneously reverse-biases said first and second PIN diodes, said reverse bias substantially preventing the flow of current through said diodes; and
switching control means coupled to said first and second PIN diodes, said switching control means comprising light generating means for simultaneously illuminating at least an interior portion of said first and second PIN diodes with light for causing said first and second PIN diodes to conduct in the presence of light, and for allowing said PIN diodes to revert, in the absence of light, to said condition of reverse bias and prevention of the flow of current therethrough.

4,899,205

ELECTRICALLY-PROGRAMMABLE LOW-IMPEDANCE ANTI-FUSE ELEMENT

Esmat Z. Hamdy, Fremont; Amr M. Mohsen, and John L. McCollum, both of Saratoga, all of Calif., assignors to Actel Corporation, Sunnyvale, Calif.

Continuation-in-part of Ser. No. 861,519, May 9, 1986, Pat. No. 4,823,181. This application Dec. 28, 1987, Ser. No. 137,935
The portion of the term of this patent subsequent to Apr. 18, 2006, has been disclaimed.
Int. Cl.[4] H01L 27/02, 29/86
U.S. Cl. 357—51 38 Claims



1. An electrically-programmable, low-impedance anti-fuse element, including:
a p-type semiconductor substrate,
a first electrode comprising a diffusion region in said substrate,
a dielectric layer over said diffusion region, said dielectric layer including a first silicon dioxide portion and a second silicon nitride portion over said first silicon dioxide portion,
a second electrode over said dielectric layer,
wherein at least one of said first and said second electrodes

is heavily doped or implanted with arsenic such that a high concentration of arsenic atoms exists at the interface between said dielectric layer and said electrode, and a controlled radius conductive filament in said dielectric layer electrically connecting said first and second electrodes.

4,899,206

SEMICONDUCTOR DEVICE

Hiromi Sakurai, and Yoichi Akasaka, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 374,865, May 4, 1982. This application Apr. 1, 1985, Ser. No. 717,597

Claims priority, application Japan, May 6, 1981, 56-69561; May 6, 1981, 56-69562; May 6, 1981, 56-69563; May 6, 1981, 56-69564

Int. Cl.[4] H01L *23/54, 21/88*

U.S. Cl. 357—67 **10 Claims**

1. A semiconductor device having a metal wiring selected from the group consisting of aluminum and an aluminum alloy which is substantially free of whiskers and hillocks, said metal wiring formed on a semiconductor wafer including at least one device, wherein said metal wiring has an amorphous layer of 800 to 2000 Å, and whereby said amorphous layer containing impurities prevents the formation of whiskers and hillocks in said metal wiring, said impurities being selected from the group consisting of aluminum, argon, phosphorous, arsenic and antimony and is present in a concentration of higher than 0.5% in relationship to the metal wiring.

4,899,207

OUTER LEAD TAPE AUTOMATED BONDING

David L. Hallowell, Westford, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 900,789, Aug. 27, 1986, abandoned. This application Jul. 14, 1988, Ser. No. 219,858

Int. Cl.[4] H01L *23/48, 23/10, 23/12*

U.S. Cl. 357—70 **16 Claims**

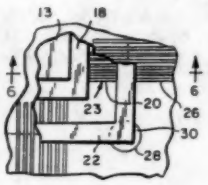
1. A lead tape assembly for electrically connecting a semiconductor chip to a substrate, the lead tape assembly comprising:

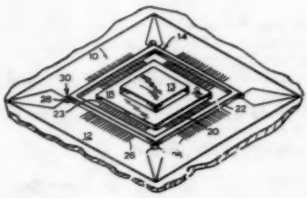
A. a plurality of conductive fingers for electrically connecting bond points on the semiconductor chip to substrate leads on the substrate, each conductive finger having an inner lead for bonding to a semiconductor chip bond point, and an outer lead distally located from the inner lead for bonding to a substrate lead;

B. an inner support ring over said conductive fingers between said inner leads and said outer leads, said inner support ring forming an aperture for receiving the semiconductor chip, said inner leads extending into said aperture;

C. an outer support ring over the ends of the outer leads for restricting the movement of the individual outer leads; and

D. adhesive means on said outer support ring securing said outer support ring to said substrate so that said outer leads





are at least temporarily maintained in registration with the substrate leads.

4,899,208

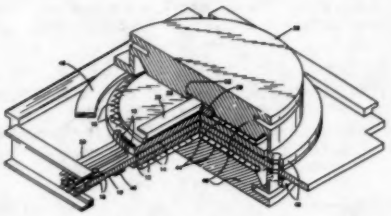
POWER DISTRIBUTION FOR FULL WAFER PACKAGE

Hans E. Dietsch, Essex, and William J. Nestork, Hinesburg, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 17, 1987, Ser. No. 134,480

Int. Cl.[4] H01L *23/02*

U.S. Cl. 357—74 **13 Claims**



1. An integrated circuit package comprising

a substrate adapted to support a semiconductor wafer on a least one side thereof;

a semiconductor wafer mounted on at least one side of said substrate;

each semiconductor wafer having a plurality of integrated circuit devices formed thereon and a plurality of electrically conducting lines extending in parallel relationship thereon, said lines being divided into at least a first group constituting a first voltage level, and a second group constituting a second voltage level, said lines being electrically connected to power the integrated circuit devices on said wafer;

first and second electrically conducting strips extending across each wafer transverse to said electrically conducting lines,

connection means connecting said first and second strips to

said first and second groups of conducting lines respectively;

means to connect said first and second strips to separate voltage levels,

whereby said strips supply operative voltage levels across the surface of the wafer; and

means to provide signals to and receive signals from said integrated circuit devices.

4,899,209

RESIN SEALED SEMICONDUCTOR DEVICE

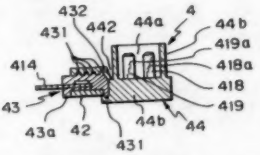
Hiroshi Shibata; Fuyuki Machara, both of Kariya; Akira Shintai, Chita, and Hidetoshi Kato, Suzuka, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 3, 1988, Ser. No. 201,757

Claims priority, application Japan, Jun. 5, 1987, 62-142043; Apr. 30, 1988, 63-108520

Int. Cl.[4] H01L *21/56*

U.S. Cl. 357—74 **53 Claims**



1. A resin sealed IC regulator comprising a first connecting terminal electrically connected to a generator, a second connecting terminal electrically connected to a device other than said generator, a monolithic IC which controls an operation of said generator mounted on a conductive member and electrically connected to both said first connecting terminal and said second connecting terminal and a resin molded portion of an electric insulating resin sealing said monolithic IC and at least a portion of said first and second connection terminals connected to said monolithic IC;

wherein said first and second connecting terminals and said conductive member are made of the same material;

wherein said resin molded portion further has a connector housing portion integrally formed thereon by molding resin in such a way that said second connecting terminals are surrounded therewith;

wherein said resin molded portion comprises a first molded portion molded with a first resin for sealing said monolithic IC and at least a portion of said first and second connecting terminals connected to said monolithic IC, and a second molded portion molded with a second resin, and externally covering at least a portion of said first molded portion;

wherein said second molded portion is integrated with a connector housing portion integrally molded with said second resin, and wherein said connector housing portion is also molded in such a way that said second connecting terminals are surrounded therewith;

wherein the first resin and the second resin are the same kind of resin.

4,899,210

HEAT SINK

Victor Lorenzetti, Dedham, and Manuel Pontes, Somerville, both of Mass., assignors to Wakefield Engineering, Inc., Wakefield, Mass.

Filed Jan. 20, 1988, Ser. No. 146,213

Int. Cl.[4] H01L *23/34, 23/36*

U.S. Cl. 357—81 **21 Claims**

1. A heat sink for an element to be cooled comprising:

a base;

a plurality of pins extending substantially perpendicular to the base, said pins being arranged in a predetermined pattern; and

at least one projection integral with said base, extending from the side thereof adjacent the element to be cooled and having an area for the projection surface parallel to the side from which it extends and adapted to make thermal contact with the element to be cooled which is sufficient to provide good thermal transfer between the heat

sink and the element while maintaining the area of contact to a fraction of the base area sufficiently small to assure that uneven thermal expansion between the heat sink and element does not cause damage to the element.

4,899,211

SEMICONDUCTOR COOLING MECHANISMS

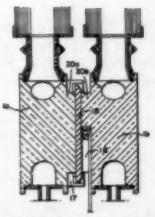
Jean-Loup Dumoulin, Chanpagne-sur-Seine, France, assignor to Jeumont Schneider Corporation, Cedex, France

Filed Jan. 12, 1987, Ser. No. 2,460

Claims priority, application France, Jan. 16, 1986, 86 00544

Int. Cl.[4] H01L *25/04*

U.S. Cl. 357—82 **21 Claims**



1. A power semiconductor cooling mechanism, comprising a metallic evaporator containing a heat-carrying fluid and configured for face-to-face contact with a power semiconductor device at an axial end of said evaporator, a condenser tube extending laterally of said evaporator and having a first end which is closed and a second end which is connected in fluid communication with said evaporator by way of an electrically insulating fluid conduit, a flexible expansion-accommodating fluid connection connecting said electrically insulating fluid conduit to said evaporator, and an envelope secured to said electrically insulating fluid conduit and enclosing said condenser tube so as to define a fluid chamber about said condenser tube, said envelope having inlet and outlet means for conducting a cooling fluid through said fluid chamber to cool said condenser tube, with pressure internally of the assembly of said condenser tube, said fluid conduit, and said evaporator being below atmospheric pressure.

4,899,212

WHITE BALANCE ADJUSTING DEVICE FOR A CAMERA

Kiyotaka Kaneko; Izumi Miyake; Kazuya Oda; Yoshio Nakane, and Hiroshi Shimaya, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 236,992, Aug. 26, 1988, abandoned. This application Jun. 15, 1989, Ser. No. 366,210

Claims priority, application Japan, Aug. 28, 1987, 62-214382; Aug. 28, 1987, 62-214383

Int. Cl.[4] H04N *9/73*

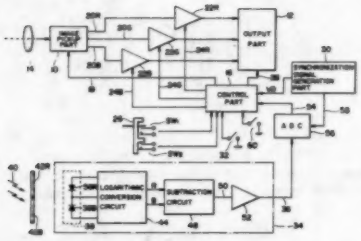
U.S. Cl. 358—29 **6 Claims**

4. A white balance adjusting device for use in a camera in which a field is photographed and a video signal representing said field is formed, said device comprising:

photographic mode setting means for setting a still mode for photographing said field as a still image and a movie mode for photographing said field as a moving image;

color temperature detecting means for detecting a color temperature of said field and outputting a color temperature signal representing said color temperature; and

control means for adjusting a white balance of said video signal in response to color temperature data that is obtained from said color temperature signal, said control



means receiving a set output from said photographic mode setting means and adjusting said white balance of said video signal at a shorter cycle as compared with said movie mode when said camera is set in said still mode.

4,899,213

A SYSTEM FOR PRODUCING IMAGE SIGNALS OF A SUBJECT IMAGE BY AN IMAGE SENSING DEVICE

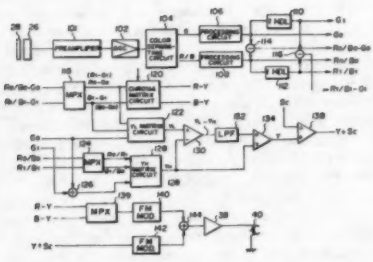
Masahiro Konishi; Masafumi Inuiya; Akira Muramatsu, and Masahiro Kato, all of 2-26-30 Nishi-azabu, Minato-ku, Tokyo, Japan

Continuation of Ser. No. 8,165, Jan. 29, 1987, abandoned. This application Jun. 12, 1989, Ser. No. 366,220

Claims priority, application Japan, Jan. 29, 1986, 61-17163

Int. Cl.[4] H04N *9/077, 9/04*

U.S. Cl. 358—44 **16 Claims**



1. A system for producing image signals, comprising:

image sensing means for picking up an image of a subject, said image sensing means comprising an image sensing device and a color filter formed thereon, said image sensing device comprising alternately-arranged first and second horizontal scanning lines of picture elements, said color filter comprising filter elements opposed to said picture elements of said image sensing device, wherein filter elements opposed to picture elements of said first horizontal scanning lines comprise alternately-arranged filter elements for separably transmitting at least red light and green light, and wherein filter elements opposed to picture elements of said second horizontal scanning lines comprise alternately-arranged filter elements for separably transmitting at least blue light and green light, said picture elements accumulating color image signals representing said image of said subject; and

signal processing means for reading out said color image signals accumulated in said picture elements of said image sensing device to produce a color difference signal R—Y in response to color image signals read out from the picture elements of a first horizontal scanning line and color image signals read out from the picture elements of a second horizontal scanning line one horizontal scanning line duration before and to produce a color difference signal B—Y in response to color image signals read out from the picture elements of a second horizontal scanning line and color image signals read out from the picture elements of a first horizontal scanning line one horizontal scanning line duration below, thereby producing line-sequential color difference signals R—Y and B—Y.

4,899,214

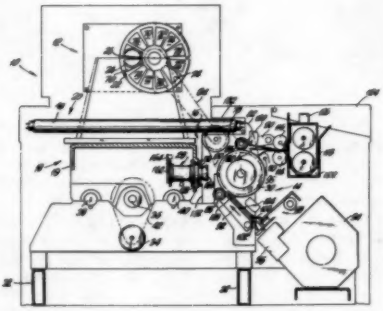
LOW COST COLOR SCANNER

Daniel H. Robbins, Rochester; John S. Wirtz, Henrietta; Juergen Lein, West Henrietta, and Michael A. Brookmire, Pittsford, all of N.Y., assignors to Itek Graphic Corp., Waltham, Mass.

Filed Sep. 2, 1988, Ser. No. 241,101

Int. Cl.[4] H04N *1/04, 1/10*

U.S. Cl. 358—75 **20 Claims**



19. A method of operating a color scanner having a movable scanning table supporting an original artwork receiving surface and a dot generator exposure source, the artwork receiving surface having a scanning table vacuum channel; an illumination source for illuminating a linear strip portion of said artwork receiving surface, said linear strip portion being perpendicular to the direction of travel of said movable scanning table; a rotating color filter wheel including at least one set of alternating red, green and blue filters; a linear detector; optical means for projecting an image of said illuminated linear strip portion through said color filter wheel to said linear detector; a cylindrical exposure drum rotatably mounted substantially parallel to the direction of travel of said dot generator exposure source; photosensitive material handling means for automatically withdrawing a sheet of photosensitive material of predetermined length from a photosensitive material supply, loading the sheet of photosensitive material onto said drum surface for exposure and unloading said sheet from said drum surface after exposure;

the method comprising the steps of:

placing an original artwork on said original artwork receiving surface;

activating said scanning table vacuum to hold said original artwork on said original artwork receiving surface;

activating said photosensitive material handling means to withdraw a sheet of photosensitive material and load said photosensitive sheet onto said exposure drum;

rotating said exposure drum for scanning exposure;

activating said illumination source;

rotating said rotating filter wheel;

advancing said scanning table;

sequentially scanning linear strip portions of said original

artwork surface through said filters with said linear detector to produce scanned readings as said scanning table advances;

activating said dot generator exposure source in response to said scanned readings to expose a halftone separation image onto the photosensitive material disposed on the surface of the rotating scanning drum as said scanning table advances and, after exposure;

activating said photosensitive material handling means to remove the exposed photosensitive material from said drum surface for processing.

4,899,215

COLOR IMAGE RECORDING APPARATUS

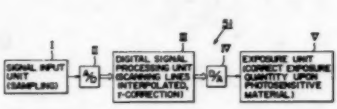
Hideki Morita; Kazuhiro Sugawara, both of Hachioji; Pe-Chieh Hung, Naritahigashi; Hirotaka Hara, Hachioji; Tadashi Nakamura, Sagamiko; Kazuyuki Kobayashi, Tama; Masashi Azuma, Hino, and Tsuyoshi Katsuta, Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 804,346, Dec. 3, 1985, abandoned. This application Dec. 28, 1987, Ser. No. 138,353

Claims priority, application Japan, Dec. 12, 1984, 59-262492; Feb. 26, 1985, 60-36771; Feb. 26, 1985, 60-36772; Mar. 19, 1985, 60-56958; Mar. 21, 1985, 60-58019; Mar. 22, 1985, 60-59284

Int. Cl.[4] H04N *1/46*

U.S. Cl. 358—78 **11 Claims**


SIGNAL INPUT UNIT (SAMPLING)
A/D
DIGITAL SIGNAL PROCESSING UNIT (SCANNING LINES INTERPOLATED, γ-CORRECTION)
D/A
EXPOSURE UNIT (CORRECT EXPOSURE QUANTITY UPON PHOTOSENSITIVE MATERIAL)

1. A color image recording apparatus having means for exposing a color photosensitive material to light responsive to a color still image signal to record a color image comprising means for obtaining picture element data by sampling each color signal of three primary colors of a still image with respect to one sample picture element every horizontal scanning line, A/D conversion means for converting the sample picture element data obtained by said means to digital signals, memory means for storing the picture element data converted by the sampled picture element data to the digital signal, means for reading out the data stored in said memory means to obtain picture element data to be recorded, means for γ-correcting said picture element to be recorded based on the data read out, D/A conversion means for converting the γ-corrected data to analog data, and exposing means for exposing said color photosensitive material to three primary colors responsive to the picture element data from said D/A conversion means.

4,899,216

METHOD OF AND APPARATUS FOR PROCESSING AN IMAGE WITH GRADATION CORRECTION OF VIDEO SIGNAL

Setsuji Tatsumi; Kazuo Shiota; Hitoshi Urabe, and Osamu Shimazaki, all of Kaisei, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 26, 1987, Ser. No. 89,553

Claims priority, application Japan, Sep. 2, 1986, 61-205173; Sep. 2, 1986, 61-205174; Sep. 2, 1986, 61-205175; Sep. 2, 1986, 61-205176

Int. Cl.[4] H04N *1/46*

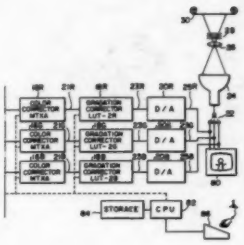
U.S. Cl. 358—80 **36 Claims**

1. A method of image processing input video signals based on lookup table data to produce gradation corrected output signals comprising the steps of:

receiving input video signals and establishing highlight points and shadow points for each of the input video signals based on cumulative histograms generated from each input video signal;

converting standard lookup table data LO through a functional transformation represented by an expression

$$L(v)=S[c\ LO\{a(v+b)\}+d]$$



to attain lookup table data L(v) associated with the input video signals in which parameters a, b, c and d are determined by passing the function represented by the expression through the highlight points and the shadow points thus established; and

effecting an image processing on the input video signals based on the lookup table data associated with the input video signals to produce said gradation corrected output signals.

4,899,217

COMMUNICATION AND ENERGY CONTROL SYSTEM FOR HOUSES

David J. MacFadyen, Derwood, Md.; Robert G. Edwards, Oak Ridge, Tenn.; Kenneth P. Wacks, Stoneham, Mass., and Daniel J. Foley, Chelmsford, Mass., assignors to Smart House Limited Partnership, Upper Marlboro, Md.

Filed Dec. 1, 1987, Ser. No. 126,794

Int. Cl.[4] H04M *11/00*

U.S. Cl. 358—86 **17 Claims**

1. An automated system apparatus for providing energy from an energy source and communication services within a house to appliances capable of receiving and generating appliance digital data, comprising:

appliance coordination data network means for communicating appliance digital data within the house;

higher capacity data network means for transferring higher capacity digital data at a rate faster than said appliance digital data within the house;

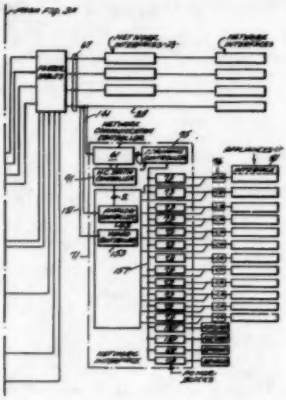
energy distribution means for supplying said energy from said source to appliances throughout the house responsive to said appliance digital data received from said appliances;

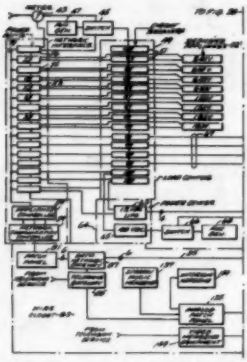
analog services distribution means for distributing conventional analog signals throughout the house;

video services distributing means for distributing conventional video signals throughout the house; and

a plurality of common outlet means disposed throughout the house for connectable attachment of said appliances, each common outlet means connected to and capable of trans-

ferring signals from said appliance digital data network means, said higher capacity data network means, said





energy distribution means, said analog services distributing means and said video services distributing means.

4,899,218

VEHICLE WHEEL ALIGNMENT APPARATUS AND METHOD

Thomas J. Waldecker, Ypsilanti; Robert Dewar, Troy; David R. Wybo, Novi, and Richard Woroniec, West Bloomfield Township, Oakland County, all of Mich., assignors to Perceptron, Inc., Farmington Hills, Mich.

Continuation of Ser. No. 15,943, Feb. 18, 1987, Pat. No. 4,745,469. This application May 16, 1988, Ser. No. 194,495

Int. Cl.[4] H04N 7/18

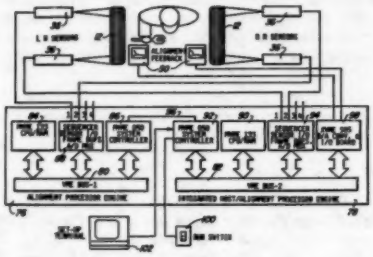
U.S. Cl. 358—93 **3 Claims**

1. A system for measuring a predetermined alignment characteristic of a wheel defining a plane normal to the axis of the axle of the vehicle on which the wheel is mounted, comprising:

means for establishing a predetermined target associated with the wheel that defines the position and orientation of said plane in three-dimensional space;

optical sensor means having associated therewith a field of view and being positioned relative to wheel so that said target is located within said field of view for creating an image of said target and converting said image to corresponding electrical signals;

processor means for processing said electrical signals, determining therefrom the position and orientation of said plane in three-dimensional space relative to a predefined



datum, and calculating therefrom said predetermined alignment characteristic of said wheel.

4,899,219

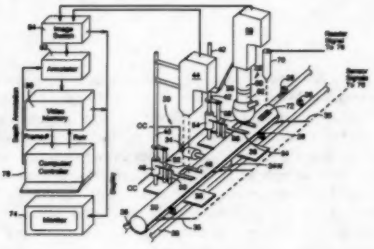
MACROVIEW AND MICROVIEW VIDEO RECORD OF CORE

Houston B. Mount, II, Tulsa, Okla., assignor to Amoco Corporation, Chicago, Ill.

Filed Oct. 31, 1988, Ser. No. 265,089

Int. Cl.[4] H04N 7/18

U.S. Cl. 358—107 **19 Claims**



1. Method for providing a video record of whole core comprising:

translating whole core supported by a core trough in discrete increments to a video recording zone;

for recording each increment of core, interrupting the movement of the core and dampening movement of the core and taking a video record of an increment of core in the video recording zone; and

storing thus taken video records of increments of core in a random access video m emory for retrieval and display.

4,899,220

METHOD AND APPARATUS FOR RECOMBINING A MAIN PANEL COMPONENT WITH A AUGMENTATION PANEL COMPONENT TO CREATE A WIDE ASPECT RATIO TELEVISON DISPLAY

Carlo Basile, New York; Alan P. Cavallerano, Ossining, and Mikhail Tsinberg, Riverdale, all of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Filed Jun. 2, 1987, Ser. No. 57,848

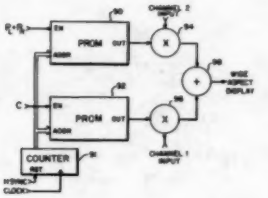
Int. Cl.[4] H04N 7/04

U.S. Cl. 358—141 **14 Claims**

1. Apparatus for creating a wide aspect ratio display comprising a plurality of horizontal line signals, in response to a

plurality of main panel component signals and a corresponding multiplicity of first and second augmentation panel component signals, said plurality of horizontal line signals constituting at least a portion of one field, said apparatus comprising:

means for combining said plurality of main panel component signals with respective ones of said first and second augmentation panel component signals to create respective horizontal line signals, wherein for each horizontal line signal of said respective horizontal line signals the main



panel component signal is combined with the first augmentation panel component signal at a first stitch point and said main panel component signal is combined with the second augmentation panel component signal at a second stitch point, and

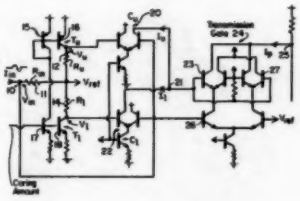
means connected to said combining means for varying the location of at least one of said first stitch point and said second stitch point in at least one of said horizontal line signals relative to another of said horizontal line signals within said portion.

4,899,221

TELEVISION SIGNAL PROCESSING APPARATUS INCLUDING RISE TIME NORMALIZATION AND NOISE REDUCTION

William G. Miller, Knoxville, Tenn., assignor to North American Philips Consumer Electronics Corp., Knoxville, Tenn.

Continuation of Ser. No. 941,498, Dec. 15, 1986, abandoned.
This application Feb. 15, 1989, Ser. No. 311,439
Int. Cl.[4] H04N *9/64*
U.S. Cl. 358—167 **9 Claims**



1. Apparatus for furnishing a desired television signal having substantially constant transition times independent of the amplitude of said transitions, comprising

gain controlled amplifier means for receiving and amplifying an input signal undergoing transitions having varying transition amplitudes and varying transition times, and furnishing an amplified video signal in response thereto;

additional means connected to said gain controlled amplifier means for furnishing a video output signal of said apparatus at least in part in response to said amplified video signal;

feedback means connected to said additional circuit means for generating a gain control signal having an amplitude varying only as a function of said transition times; and

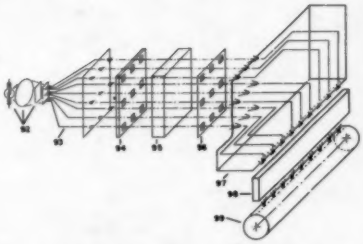
means for applying said gain control signal to said gain controlled amplifier means to control the gain thereof, whereby said video output signal constitutes said desired television signal.

4,899,222

MAGNETO-OPTIC AND FIBER-OPTIC DIGITAL PRINT HEAD

Edgar E. Price, 402 Giovanni Dr., Nokomis, Fla. 34275

Filed Dec. 16, 1988, Ser. No. 284,916
Int. Cl.[4] G01D *9/42*; G02F *1/09*; G02B *5/30, 6/00*
U.S. Cl. 358—296 **18 Claims**



1. An optical system for separately and independently modulating or on-off switching light in each of a multiplicity of separately propagated light beams, including,

an array of a multiplicity of optical fibers, each having an input region at which light can enter and be received, a region through or along which light can be propagated internally, and an output region from which light can emerge, the disposition of the array being such that light can be directed into and be received at the input region of each optical fiber and light leaving the output region of each optical fiber emerges at a predesignated one of a set of predetermined separate positions propagated along a predesignated one of a set of predetermined separate directions,

a first optical polarizer,

optical means to receive light propagated from the output region of each optical fiber of the array and direct it through the first optical polarizer to a prespecified one of a set of preselected separate locations,

an arrangement of a multiplicity of magneto-optic light modulators, each on a different part of the surface of a single body, each having an input region at which light can enter and be received, a region in which light can be modulated, and an output region from which modulated light can emerge, each magneto-optic light modulator of the arrangement being controlled separately electrically or electronically to modulate the received light, the disposition of the arrangement being such that the input region of each magneto-optic light modulator of the arrangement coincides with a preestablished one of the set of preselected separate locations and can receive light propagated from a prescribed optical fiber of the array through the optical means and the first optical polarizer,

a second optical polarizer.

whereby light beams passing through the optical fiber array, the optical means, the first optical polarizer, the magneto-optic light modulator arrangement, and the second optical polarizer constitutes separately and independently modulated separately propagated light beams.

4,899,223

ELECTRODE ARRAY FOR AN ELECTROOPTICAL FACSIMILE RECORDER AND METHOD OF CONTROLLING SAID ELECTRODE ARRAY

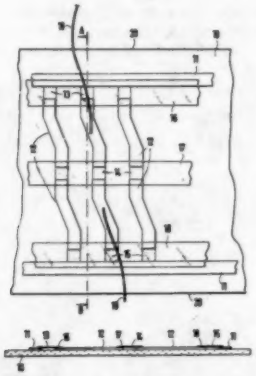
Johann Springer, Aichwald, and Wolfgang Heck, Gerlingen, both of Fed. Rep. of Germany, assignors to Alcatel N.V., Amsterdam, Netherlands

Filed Nov. 16, 1988, Ser. No. 272,482

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1987, 3739381

Int. Cl.[4] G01D *9/42, 13/14*

U.S. Cl. 358—302 **26 Claims**



1. Electrode array deposited on a common surface of an electrooptical substrate so as to form at least three partial lines of electrically, each having at least three independently, controllable light gates, said electrode array comprising

two main electrodes extending parallel to one another in a line direction parallel to said partial lines, and

a plurality of spot electrodes interposed between said two main electrodes in a second direction generally perpendicular to the line direction and electrically isolated from each other and from the main electrodes,

wherein each of the light gates is defined by opposing portions of two adjacent said electrodes.

4,899,224

RECORDING APPARATUS AND METHOD UTILIZING AN ARRAY OF LIQUID CRYSTAL CELLS

Yuji Ooba, Tokyo; Shigeo Sugihara, Kunitachi; Tadaaki Masumori, Kodaira, and Shinichi Shiwa, Yokosuka, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Jun. 23, 1988, Ser. No. 210,448

Claims priority, application Japan, Jul. 3, 1987, 62-165186; Dec. 1, 1987, 62-301411; Dec. 1, 1987, 62-301412

Int. Cl.[4] H04N *5/76*

U.S. Cl. 358—332 **27 Claims**

1. A recording apparatus comprising:

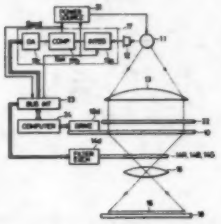
a two-dimensional recording head having windows arranged in a matrix form, said windows being capable of controlling the transmission and interception of light in accordance with a binary image signal representing an image and retaining the transmitting and intercepting states;

write control means for applying said image signal to said two-dimensional recording head so that the light transmitting or intercepting state corresponding to the image is written into each of said matrix-arranged windows in accordance with said image signal, said write control means including means for generating an exposure start signal after completion of writing the light transmitting and intercepting states into said two-dimensional recording head;

light irradiating means disposed on one side of said two-dimensional recording head for irradiating said two-dimensional recording head with light;

holding means fixedly positioned on the other side of said two-dimensional recording head for holding a recording medium;

optical image forming means disposed between said two-dimensional recording head and said holding means for



forming on said recording medium an optical image represented by the light transmitting and intercepting states of said matrix-arranged windows; and

exposure control means for starting exposure of said recording medium to the optical image formed thereupon in response to said exposure start signal and controlling the exposure so that the total quantity of light which has been irradiated on said two-dimensional recording head since the generation of said exposure start signal becomes equal to a predetermined exposure value.

4,899,225

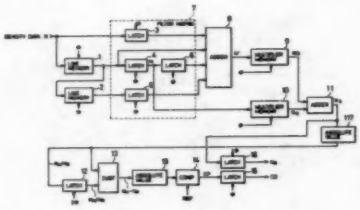
IMAGE PROCESSING METHOD

Kazuyasu Sasuga; Hiroaki Ishizawa; Hisao Suzaki, and Masato Toho, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Dec. 31, 1987, Ser. No. 140,129

Int. Cl.[4] H04N *1/40*

U.S. Cl. 358—448 **14 Claims**



7. An image processing apparatus for subjecting a plurality of picture elements representing an image comprised of character and half tone areas to a plurality of individual enhancement processings on an area basis, said apparatus comprising:

means for reading out density data corresponding to a respective one of the plurality of picture elements;

a two-dimensional image filter centered around a subject picture element corresponding to one of the plurality of picture elements;

means for switching coefficients of said two-dimensional image filter on a time-sharing basis to a plurality of sets of selected values, at least one of said plurality of sets of selected values corresponding to one of said plurality of individual enhancement processings to output a plurality

of filter outputs corresponding to said plurality of picture elements;

means for selecting one of said character and half tone areas corresponding to said subject picture element, based on said plurality of filter outputs; and

means for subjecting said subject picture element to related enhancement processing in accordance with said selected area corresponding to said subject picture element.

4,899,226

IMAGE READING APPARATUS WHICH CORRECTS FOR A READING ERROR CAUSED BY READING AN IMAGE AT A CONTINUOUSLY-VARIABLE IMAGE READING DENSITY WITH STAGGERED LINE IMAGE SENSORS

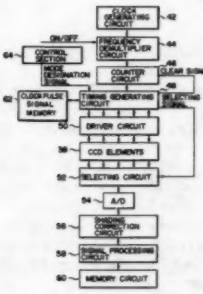
Koji Tanimoto, Yokohama; Kunihiko Miura, Hiratsuka, and Junichi Koseki, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 16, 1987, Ser. No. 134,508

Claims priority, application Japan, Dec. 20, 1986, 61-304363

Int. Cl.[4] H04N *1/393, 1/028, 1/10, 1/12*

U.S. Cl. 358—451 8 Claims



1. An image-reading apparatus having a deviation correcting function comprising:

first and second line image sensor means for scanning an object in a main scanning direction and photoelectrically converting light from the object, and having an image reading density variable in a secondary scanning direction perpendicular to said main scanning direction, said first and second line image sensor means arranged in two rows separated in said secondary scanning direction such that said first line image sensor means reads an image of the object earlier than said second line image sensor means;

memory means for storing a plurality of drive signals corresponding to the separation of the first and second line image sensor means in the secondary scanning direction and a plurality of image reading densities;

designating means for designating one of the drive signals stored in the memory means which corresponds to a current image reading density of the first and second line image sensor means; and

drive means for supplying said designated drive signal to said first and second line image sensor means in response to the designation by said designating means.

4,899,227

IMAGE PROCESSING APPARATUS DETECTING THE SIZE OR POSITION OF AN INFORMATION PORTION OF AN ORIGINAL

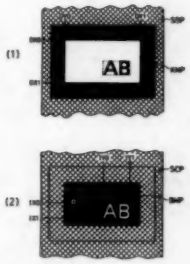
Masanori Yamada, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 21, 1988, Ser. No. 147,357

Claims priority, application Japan, Jan. 26, 1987, 62-17054; Mar. 12, 1987, 62-57361

Int. Cl.[4] H04N *1/393, 1/387, 1/40*

U.S. Cl. 358—452 9 Claims



1. An image processing apparatus comprising:

an original supporting table for supporting an original, the original having an information portion and a non-information portion;

reading means for reading an area of said table including an area on which the original is placed, and for generating image data corresponding to the read area;

first detector means for detecting the position of the original on said table based on image data from said reading means; and

second detector means for detecting the position or the size of the information portion of the original based on image data from said reading means.

4. An image processing apparatus comprising:

an original supporting table for supporting an original, said original having an information portion and a non-information portion;

reading means for reading an area of the table including and area on which the original is placed and for generating image data corresponding to the read area;

first detector means for detecting the position or size of the original on said table based on image data from said reading means;

second detector means for detecting the position or size of the information portion of said original based on image data from said reading means; and

process means for processing image data from said reading means based on either the result of the detection by said first detector means or the result of the detection by said second detector means.

7. An image processing apparatus comprising:

an original supporting table for supporting an original, said original having an information portion and non-information portion;

reading means for reading an area of said table including an area on which the original is placed, and for generating image data corresponding to the read area;

detector means for detecting the position or size of the information portion of said original based on image data from said reading means; and

process means for processing image data corresponding to the information portion of the original based on the result of the detection by said detector means.

4,899,228

MANUALLY SWEEPING APPARATUS WITH IMAGE SENSOR

Teruo Sano, Kawasaki, and Masaharu Shioya, Akikawa, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

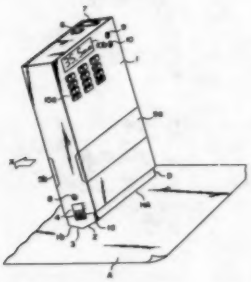
PCT No. PCT/JP87/00380, § 371 Date Feb. 3, 1988, § 102(e) Date Feb. 3, 1988, PCT Pub. No. WO87/07804, PCT Pub. Date Dec. 17, 1987

PCT Filed Jun. 12, 1987, Ser. No. 171,873

Claims priority, application Japan, Jun. 12, 1986, 61-134893; Dec. 24, 1986, 61-309421

Int. Cl.[4] H04M *1/04*

U.S. Cl. 358—473 17 Claims



1. A manually sweeping apparatus, including a manually manipulatable housing, said housing comprising:

reading means having a reading area with a predetermined length, for reading image information on a material and for producing image information signals in accordance with the image information, while said housing is manually swept across the material in a direction substantially perpendicular to a direction of the length of the reading area;

memory means for storing the image information signals produced by said reading means;

designating means for designating a reading length over which the image information will read, said reading length being in a direction of the length of said reading area;

position detecting means for detecting a relative position of said housing with respect to said material while said housing is being swept across said material, and for producing a position signal every time said housing is swept over a predetermined distance, said position signal representing the position of said housing with respect to said material; and

storing control means for controlling a storing operation of said memory means in response to the reading length designated by said designated means, and for storing the image information signals produced by said reading means into said memory means, said image information signals corresponding to image information which exists on said material in the reading length designated by said designating means.

4,899,229

VIDEO INFORMATION EDITING SYSTEM FOR PROVIDING VIDEO DATA IN A CONTROLLED FORMAT

Masashi Hashimoto, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 22, 1988, Ser. No. 158,481

Claims priority, application Japan, Feb. 2, 1987, 62-38631

Int. Cl.[4] G11B *27/02*

U.S. Cl. 360—141 15 Claims

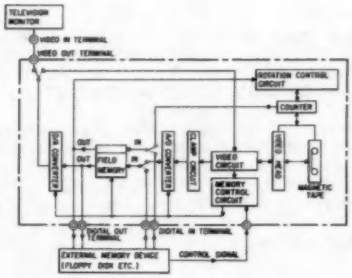
1. A video information editing system for providing the video data produced on a video tape by a video tape recorder/-playback device in a controlled format to permit selective viewing of the video data as graphically displayed on a video monitor upon playback thereof, said video information editing system comprising:

a video tape recorder/playback device including video head means and adapted to contain a video tape;

field memory means having memory storage for storing at least one frame of video data, said field memory means being operably connected to said video tape recorder/-playback device;

video data write means connected to the output of said video tape recorder/playback device for accepting analog video data from a video tape upon reproduction thereof;

analog-digital converter means interposed between said video data write means and said field memory means for converting analog video data from the output of said



video data write means into digital video data for input to said field memory means;

memory control means connected between said video data write means and said field memory means for regulating the writing of video data from said video data write means into said field memory means;

interface means operably connected to said field memory means and to said video tape recorder/playback device, said interface means being adapted to be connected to external memory means to control the writing of digital video data from said field memory means into the external memory means and from the external memory means into said field memory means; and

digital-analog converter means connected to the output of said field memory means to convert the digital video data output therefrom into analog video data for input to a video monitor for graphic display thereof.

4,899,230

TAPED DATA COPYING UTILIZING MULTIPLE ADDRESSABLE MEMORIES

Jay G. Sherritt, Boulder, Colo., assignor to IDB Corporation, Boulder, Colo.

Filed Dec. 22, 1987, Ser. No. 137,523

Int. Cl.[4] G11B *5/86*

U.S. Cl. 360—15 21 Claims

1. A device for generating multiple copies of data stored on a master, said device comprising:

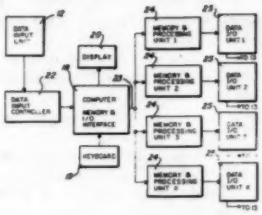
means for reading said data stored on said master and, without contemporaneous storage of a substantial amount of said data thereat, providing output indicia indicative thereof;

a broadcast line for receiving said indicia from said read means and directly broadcasting said indicia thereon;

a plurality of memory means connected with said broadcast line so that each of said plurality of memory means receives said indicia and stores a representation thereof, and

with each of said memory means providing from said representations said indicia as the output therefrom; and

a plurality of copying means each of which is connected with a different one of said plurality of memory means to



receive said indicia therefrom, each of said copying means, responsive to receipt of said indicia from said memory means connected therewith, generating a copy of said master.

4,899,231

VIDEO CAMERA AND SEPARABLE VIDEO RECORDER/REPRODUCER ARRANGEMENT

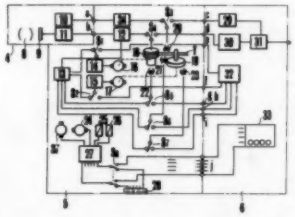
Masaya Maeda; Hiroyuki Takimoto, and Susumu Kozuki, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 153,463, Feb. 1, 1988, abandoned, which is a continuation of Ser. No. 57,714, Jun. 1, 1987, abandoned, which is a continuation of Ser. No. 729,682, May 2, 1985, abandoned, which is a continuation of Ser. No. 351,605, Feb. 23, 1982, Pat. No. 4,531,164. This application Feb. 8, 1989, Ser. No. 309,045

Claims priority, application Japan, Feb. 26, 1981, 56-27140; Mar. 6, 1981, 52-32106; Mar. 6, 1981, 52-32107; Jun. 24, 1981, 56-97913

Int. Cl.[4] H04N *5/782*

U.S. Cl. 360—33.1 **7 Claims**



1. An information signal recording apparatus, comprising:

(a) a rotary head for recording information signals on a tape-shaped recording medium;

(b) a cylindrical member for supporting the rotary head, said cylindrical member having a peripheral surface;

(c) a head driving motor for rotating the rotary head at a predetermined speed;

(d) tape loading means for shifting the tape-shaped recording medium between a first position in which said medium does not contact the peripheral surface of the cylindrical member, and a second position in which said medium is aligned with the peripheral surface;

(e) a power source for generating electrical power;

(f) a power switch which can be changed over between a first condition and a second condition by one stroke of a manual operation and supplies said electrical power to said head driving motor and said tape loading means when it is in the first condition, and does not supply the electrical power to said head driving motor and said tape loading means when it is in the second condition, said power switch being directly connected to said power source;

(g) a trigger switch operated by a manual operation for instructing a recording start by said rotary head, said trigger switch being invalid while said power switch is in said second condition; and

(h) a control circuit responsive to the manual operation for changing over said power switch from said second condition to said first condition, for controlling said head driving motor and said tape loading means, so that said rotary head rotates at the predetermined speed and the tape-shaped recording medium is shifted from the first position to said second position.

4,899,232

APPARATUS FOR RECORDING AND/OR REPRODUCING DIGITAL DATA INFORMATION

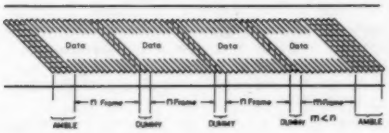
Kentaro Odaka, Tokyo; Shinya Ozaki, Kanagawa; Masaki Yamada, Kanagawa; Hiroshi Ishihashi, Kanagawa, and Yoshizumi Inazawa, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 5, 1988, Ser. No. 177,624

Claims priority, application Japan, Apr. 7, 1987, 62-085388; Jun. 15, 1987, 62-148174; Jun. 25, 1987, 62-158346; Jun. 26, 1987, 62-158885

Int. Cl.[4] G11B *5/09*

U.S. Cl. 360—48 **6 Claims**



1. An apparatus for recording digital data information on a recording medium, comprising:

(a) recording means for recording inputted digital signals in separate frames, each one of which is made up of two oblique tracks; and

(b) control means for dividing said inputted digital data information into N frames, where N is an integer, interspersing between each such N frames of inputted digital data information a predetermined number of frames of non-inputted digital data information, and supplying the divided inputted digital data information and non-inputted digital information to said recording means whereby between every N frames of recorded inputted digital data information there are a predetermined number of frames of recorded non-inputted digital information.

4,899,233

APPARATUS FOR REPRODUCING A MAGNETICALLY RECORDED DIGITAL SIGNAL USING A ROTARY HEAD WITH AUTOMATIC TRACK FINDING SIGNAL EXTRACTION AND SELECTION FOR TRACKING CONTROL

Shiro Yoshida, Maebashi, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Mar. 21, 1988, Ser. No. 171,079

Claims priority, application Japan, Mar. 20, 1987, 62-66534

Int. Cl.[4] G11B *5/52*

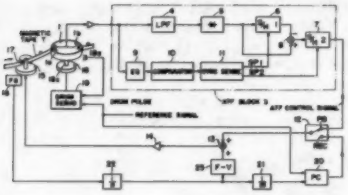
U.S. Cl. 360—77.14 **3 Claims**

1. An apparatus for reproducing a recorded digital signal using a rotary head which recorded digital signal is a multiple signal including pulse code modulated sound data of a fixed time period duration obtained by applying a pulse code modulation to an audio signal, subcodes time-divisionally multi-

plexed before and after said pulse code modulated sound data by predetermined time periods, respectively, and a track finding signal, and which recorded digital signal is recorded on tracks formed in succession on a magnetic tape by a rotary head in a first mode, or in a second mode where its data capacity per unit time is nearly one-half of that in said first mode and in which second mode a revolving speed of said rotary head and a magnetic tape running speed are nearly one-half of those in said first mode, thus to reproduce a signal including cross-talk components of a pilot signal from an adjacent track and having been recorded on said recorded magnetic tape, said apparatus comprising:

an automatic track finding signal selecting and extracting circuit means for forming a start signal by using input data read from said tape and a clock;

a timing signal generating circuit means for responding to said start signal from said automatic track finding signal



selecting and extracting circuit means to count clock periods, thus to generate a trigger signal every time the count value thereof reaches a first predetermined value and to form a reset signal every time said count value thereof reaches a second predetermined value larger than said first predetermined value;

a sampling signal generating circuit means reset by said reset signal and counting clock periods, for forming a sampling signal every time said sampling signal generating circuit means counts a predetermined number of clock periods in accordance with said trigger signal;

a sensing circuit means for sensing an automatic track finding signal in said reproduced signal in accordance with said sampling signal from said sampling signal generating circuit means; and

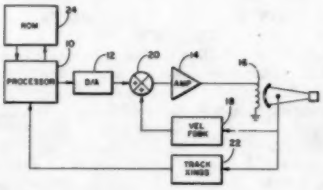
means for generating a tracking error signal from said sampling signal and said cross-talk components.

4,899,234

ADAPTIVE VELOCITY PROFILE FOR DISK ACTUATOR CONTROL

Stephen R. Genheimer, Yukon, Okla., assignor to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Apr. 4, 1988, Ser. No. 177,301
Int. Cl.[4] G11B *5/55, 21/08*
U.S. Cl. 360—78.06 **6 Claims**



5. The method of moving a head from a first position adjacent a first track on a disk to a second position adjacent second track on the disk, comprising

accelerating said head to a predetermined maximum velocity,

measuring the time required to accelerate said head to a predetermined position, the velocity of said head at said predetermined position being less than or equal to said maximum velocity,

identifying the time required to accelerate said head to said predetermined position under "worst case" acceleration conditions,

calculating a performance factor based on the ratio of the measured and identified times,

identifying a third position for said head where deceleration of said head is expected to commence to halt movement of said head at said second position under "worst case" deceleration conditions,

determining a fourth position of said head, between said third and second positions, based on the third position and said performance factor, and

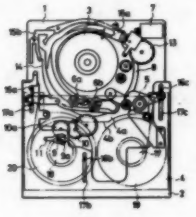
commencing deceleration of said head when said head reaches its fourth position.

4,899,235

MAGNETIC TAPE LOADING MECHANISM AND METHOD

Kiyoshi Kano; Nobuyuki Kaku; Atsuo Osawa; Shinya Fujimori, all of Yokohama, and Yoshihiro Fukagawa, Katsuta, all of Japan, assignors to Hitachi Video Engineering, Inc., Yokohama and Hitachi, Ltd., Tokyo, both of, Japan

Filed Feb. 4, 1988, Ser. No. 152,377
Claims priority, application Japan, Feb. 10, 1987, 62-29308
Int. Cl.[4] G11B *15/66*
U.S. Cl. 360—85 **9 Claims**



1. A magnetic tape cassette loading mechanism comprising a rotary cylinder on which a magnetic head is provided, cassette receiving means on which a magnetic tape-carrying cassette is to be set, a tape loading mechanism having a tape loading arm and being adapted to withdraw said magnetic tape from said cassette by said tape loading arm and wind said magnetic tape around said rotary cylinder, a cassette moving mechanism adapted to start moving said cassette toward said rotary cylinder a predetermined period of time after the starting of movement of said tape loading arm and complete the movement of said cassette before the completion of movement of said tape loading arm, and supporting means having a first chassis for supporting said rotary cylinder, said cassette receiving means, said tape loading mechanism and said cassette moving mechanism.

4,899,236

RECORDING OR REPRODUCING APPARATUS USING CONTAINER MOUNTED STRIP-LIKE RECORDING MEDIUM

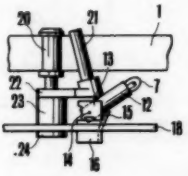
Hiroo Edakubo, Tokyo; Takashi Itani; Takashi Narasawa, both of Kanagawa; Tatsuzo Ushiro, Tokyo; Hiroshi Watanabe, Tokyo, and Masahide Hasegawa, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Japan

Continuation of Ser. No. 861,108, May 6, 1986, abandoned, which is a continuation of Ser. No. 437,470, Oct. 28, 1982, abandoned. This application Jan. 13, 1988, Ser. No. 145,657

Claims priority, application Japan, Nov. 5, 1981, 56-177450; Nov. 5, 1981, 56-177449

Int. Cl.[4] G11B *15/665*

U.S. Cl. 360—95 10 Claims



1. A recording and/or reproducing apparatus using a strip-like recording medium in a container, the apparatus comprising:

(a) recording and/or reproducing means for recording and/or reproducing a signal on and or from the recording medium;

(b) loading means for taking out the strip-like recording medium from the container for recording and/or reproducing by said recording and/or reproducing means;

(c) light emitting and/or light receiving means for detecting a specified part of the strip-like recording medium, the specified part having a characteristic different from other parts of the medium;

(d) supporting means for supporting at least a part of said light emitting and/or light receiving means so that it is shiftable between a first position outside a space through which the medium is passed by the taking out operation of said loading means and a second position located within said space; and

(e) positioning means for positioning said part of the light emitting and/or light receiving means at said first position during a term when said medium is passing said second position by the taking out operation of said loading means and for positioning said part of the light emitting and/or light receiving means at said second position after said medium has passed said second position.

4,899,237

DIVIDED HOUSING FOR SUPPORTING MAGNETIC DISKS

Kazunori Tochiyama, Kawasaki, and Takahisa Mihara, Sagamihara, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 142,999, Jan. 12, 1988, abandoned. This application Jun. 15, 1989, Ser. No. 366,366

Claims priority, application Japan, Jan. 14, 1987, 62-004993

Int. Cl.[4] G11B *5/012, 17/08*

U.S. Cl. 360—98.02 9 Claims

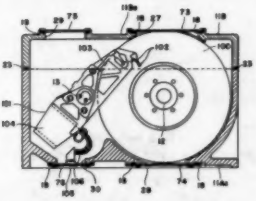
1. A housing for supporting a magnetic disk pack and a magnetic head positioner therein, said magnetic disk pack including a plurality of magnetic disks supported by a first spindle having opposite ends, said magnetic head positioner including a second spindle having opposite ends and supporting a plurality of arms, each arm carrying a magnetic head, the housing comprising:

a shell having an open end, a closed end and two opposite sidewalls, said shell having a one-piece construction;

a cover detachably connected to the open end of said shell, said cover having a one-piece construction:

said shell and cover having open edges which are coplanar when joined to each other to form a chamber which encloses said magnetic disk pack and said magnetic head positioner therein, thereby mechanically sealing the magnetic disk pack and magnetic head positioner off from the exterior of the chamber;

said shell mechanically supporting both of said magnetic disk pack and said magnetic head positioner, and said cover closing the open end of the shell through which said



magnetic disk pack and said magnetic head positioner are inserted; and

a first pair of supporting means mounted in a first pair of axially aligned circular holding holes, one hole of each pair being formed in each of the two opposite sidewalls of said shell for receiving a corresponding one of the first pair of supporting means which supports said first spindle at opposite ends thereof, each hole of the first pair of circular holding holes having a continuous circumferential edge;

the plane containing said open edges of said shell and cover being-non-intersecting with and non-tangent to said first pair of holding holes and said first pair of supporting means.

4,899,238

CARTRIDGE SHUTTER ACTUATING DEVICE IN RECORDING AND/OR REPRODUCING APPARATUS

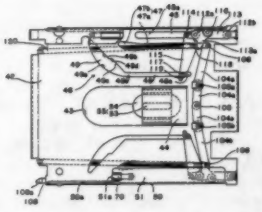
Yoshihisa Inoue, Saitama, and Yasunori Arai, Tokyo, both of Japan, assignors to Nakamichi Corporation, Tokyo, Japan

Filed Oct. 31, 1988, Ser. No. 265,212

Claims priority, application Japan, Oct. 31, 1987, 62-276778

Int. Cl.[4] G11B *5/012*

U.S. Cl. 360—99.06 6 Claims



1. A device for opening a laterally slideable shutter of a disc cartridge along with insertion of the disc cartridge in a disc cartridge inserting direction into a holder of a recording and/or reproducing apparatus for performing recording and/or reproducing operation on a disc-shaped recording medium contained in the disc cartridge, comprising;

at least one arm member rotatable about a pivot provided at

one end thereof and having at the other end a first engaging portion adapted to be in engagement with said shutter substantially during insertion of said disc cartridge;

first guide means extending in an oblique direction between the cartridge inserting direction and a direction in which said shutter is slid to open for guiding therealong a second engaging portion of said arm member during insertion of said disc cartridge, thereby rotating said arm member to open said shutter due to continued engagement thereof with said first engaging portion;

supporting means for moveably supporting said pivot of said arm member while said second engaging portion is being guided along said first guide means; and

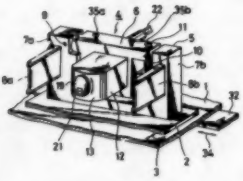
spring means for biasing said arm member toward a direction opposite to the cartridge inserting direction.

4,899,239

AUTO-REVERSE TAPE RECORDER OF THE HEAD TURNING OVER TYPE

Kunio Kido, Wako, Japan, assignor to Tanashin Denki Co., Ltd., Tokyo, Japan

Filed Sep. 22, 1987, Ser. No. 99,604
Claims priority, application Japan, Mar. 3, 1987, 62-46763
Int. Cl.[4] G11B 5/55
U.S. Cl. 360—106 **9 Claims**



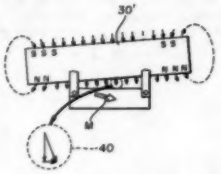
1. A tape recorder of the automatic reversing type, comprising a head mount, a magnetic head structure including a magnetic head, means on said head mount for mounting said magnetic head for rotation around an axis at a substantially fixed position on said head mount, said head mount being mounted for movement between an inoperative position and an operative position in which at least part of said magnetic head structure is received in a tape cassette loaded in position in said tape recorder and said magnetic head contacts with a tape in the tape cassette in order to effect recording or reproduction of the tape, a pair of fixed tape guides secured to said head mount for contacting, at opposite positions within respect to said magnetic head, with the tape to inhibit lateral widthwise movement of the tape w hen said head mount is in its operative position, and a head turning over mechanism operable in response to a tape feeding direction reversing signal for rotating said magnetic head structure substantially by an angle of 180° degrees around its axis of rotation with said magnetic head held in contact with the tape in order to allow said magnetic head to subsequently record on or reproduce from the tape during subsequent feeding of the tape in the reverse direction, wherein said head mount includes a fixed base member secured to a head plate which is mounted for movement toward and away from the tap cassette loaded in position, said magnetic head structure being coupled to said fixed base member, said head mount further including a movable base member mounted on said fixed base member in such a manner as to allow adjustment of the position of said movable base member in a lateral widthwise direction of the tape.

4,899,240

BIASING FOR A UMR HEAD

Richard J. McClure, San Diego, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 28, 1988, Ser. No. 225,416
Int. Cl.[4] G11B 5/39
U.S. Cl. 360—113 **10 Claims**



1. A substantially unshielded magnetoresistive head comprising

a. an elongated thin-film structure having an easy axis of magnetization that is generally along the length of said film, and having a hard axis of magnetization that is generally in the plane of and perpendicular to the easy axis of the film, and

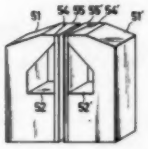
b. single magnetic means in proximity to said film and having a composite field exiting therefrom which has first and second field components cooperative with said film, said first field component being in the direction of the easy axis of said film, and said second component being in the direction of the head axis of said film.

4,899,241

METHOD OF MANUFACTURING A MAGNETIC HEAD HAVING A THIN FILM IN A PORTION OF ITS CORE

Hideaki Miyakawa, and Makoto Kameyama, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 20,176, Feb. 27, 1987, abandoned, which is a continuation of Ser. No. 621,718, Jun. 18, 1984, abandoned. This application Jan. 28, 1988, Ser. No. 149,945
Claims priority, application Japan, Jul. 5, 1983, 58-121908
Int. Cl.[4] G11B 5/16
U.S. Cl. 360—125 **14 Claims**



1. A method for manufacturing a magnetic head which forms a track of a predetermined track width on a magnetic recording medium, comprising the steps of:

depositing a thin film of a non-magnetic material on at least a portion of a first surface of a magnetic member;

depositing a magnetic thin film on said non-magnetic thin film to form a laminated block, the direction of growth of said magnetic film being substantially perpendicular to said first surface;

cutting said laminated block in a plurality of planes parallel with each other to form a plurality of magnetic head core blocks, wherein the planes cross through said magnetic member, said non-magnetic thin film and said magnetic thin film, and an interval of two adjacent planes of said plurality of planes corresponding to the predetermined track width; and

bonding two reinforcing members of a non-magnetic material on two opposing surfaces of at least one of said magnetic head core blocks provided by said two adjacent planes of said cutting step.

4,899,242

LOCKING MECHANISM OF MAGNETIC TAPE CASSETTE

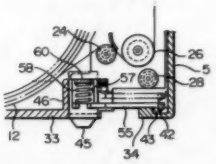
Kenji Hashizume, Nagano; Masaru Ikebe, Komoro; Masatoshi Okamura, Saku, and Haruo Shiba, Komoro, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Jul. 6, 1988, Ser. No. 215,833

Claims priority, application Japan, Jul. 9, 1987, 62-104487; Jul. 9, 1987, 62-104488; Jul. 9, 1987, 62-104489; Jul. 9, 1987, 62-104490

Int. Cl.[4] G11B *23/08*

U.S. Cl. 360—132 **5 Claims**



1. A front cover locking mechanism in a magnetic tape cassette to be used in a recorder, comprising a cassette case having a front portion having opposite lateral ends, a front cover provided with end plates juxtaposed with the respective lateral ends of said case, said front cover being pivotally mounted on said lateral ends of said front portion of the case at said end plates for opening and closing said front portion of the cassette case and a front cover locking mechanism,

said front cover locking mechanism including a locking lever slidably mounted in at least one of the said lateral ends of said case, a compression coil spring for biasing the locking lever and an anchoring means provided in said end plate, said locking lever comprising an elongated slide member slidably guided by a guiding mechanism formed in said lateral end of the cassette case, a free end engageable by an unlocking means in the recorder to unlock the locking lever and an anchoring click facing the end plate of said front plate and adapted to engage the anchoring means of said end plate under the action of said compression coil spring, which normally biases said locking lever toward the end plate.

4,899,243

FLAT SPRING STRUCTURE FOR MAGNETIC TAPE CASSETTES, IN PARTICULAR VIDEO CASSETTES

Abramo Bordignon, Senago, Italy, assignor to A.T.B. S.p.A., Senago MI, Italy

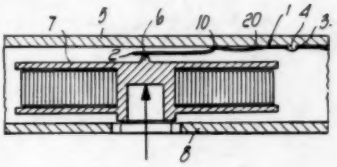
Filed Dec. 8, 1987, Ser. No. 130,254

Claims priority, application Italy, Dec. 23, 1986, 24218/86[U]; Dec. 23, 1986, 24219/86[U]

Int. Cl.[4] G11B *23/02*

U.S. Cl. 360—132 **9 Claims**

1. Flat spring structure for magnetic tape cassettes, in particular video cassettes, comprising an elastic lamina with an elongated configuration which is coupleable, at a middle portion thereof, with the cover of a cassette and acting, proximate to its free ends, on the central pivot of the reels supporting the magnetic tape, said spring comprising, on the side facing towards said reels, the configuration of a concave piecewise line with at least one fold line in the portion comprised between the free end and the zone of coupling with the cover, said fold line, with said elastic lamina inserted in said cassette, being adapted to engage by contact with said cover to define at least one fulcrum point for elastic oscillation of said lamina, said fulcrum point having a distance from said pivot of the reel



which is smaller than the distance between said pivot and said zone of coupling with the cover.

4,899,244

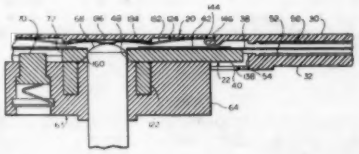
DISK CARTRIDGE WITH HUB SEAL

John B. Morse, Boston, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jul. 28, 1988, Ser. No. 225,463

Int. Cl.[4] G11B *23/03, 17/022*

U.S. Cl. 360—133 **17 Claims**



1. A disk cartridge for use with a disk drive having a rotor, including a spindle, for rotating a disk, said cartridge comprising:

a disk having a recording medium thereon and including a hub having a spindle receiving central aperture through which the spindle extends and protrudes when said hub is in engagement with the rotor;

a case enclosing said disk, said case including first and second walls disposed on opposite sides of said disk, said first wall having an access opening therein providing access for the rotor to engage said hub when said cartridge is operatively positioned in the disk drive;

means, within said case disposed in a first position engaging disk when said cartridge is not operatively positioned in the disk drive, for urging said disk toward said first wall so that said hub closes said access opening and said urging means closes said central aperture to prevent entry of disk contaminants therethrough, said urging means being displaceable from said first position by said spindle protruding from said central aperture, when said cartridge is operatively positioned in the disk drive, to a second position wherein said urging means is disengaged from said disk to free said disk for rotation.

4,899,245

METHOD OF CHECKING MAGNETIC TAPE CASSETTE LID OPENING OPERATION

Kazuo Kubota, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 27, 1988, Ser. No. 212,380

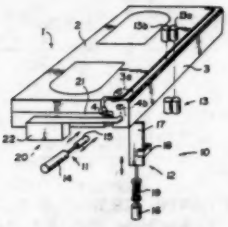
Claims priority, application Japan, Jul. 1, 1987, 62-164688

Int. Cl.[4] G11B *23/00*

U.S. Cl. 360—137 **1 Claim**

1. A method of checking a videotape cassette for opening and closing function of a cassette cover which is mounted on a cassette casing to be movable between a closed position and an open position and is urged toward the closed position by a

closing spring, the cassette casing being provided with a lock mechanism having a lock member which is movable between a locking position in which it is engaged with the cassette cover in the closed position to lock the cassette cover to the closed position, and a lock releasing position in which it releases the cassette cover, and a locking spring which normally urges the the lock member toward the locking position,



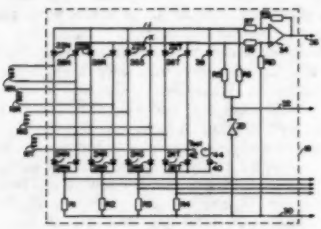
said method comprising steps of urging the lock member toward the lock releasing position, releasing the lock member, urging the cover toward the open position, releasing the cover, subsequently detecting the position of the cover, urging the lock member to the lock releasing position, bringing the cover to the open position with the lock member held in the lock releasing position, releasing the cover and detecting the position of the cover.

4,899,246

SOLID-STATE TRIP DEVICE COMPRISING A ZERO SEQUENCE CURRENT DETECTION CIRCUIT

Paul Tripodi, Eybens, France, assignor to Merlin Gerin, France

Filed Mar. 1, 1988, Ser. No. 162,592
Claims priority, application France, Mar. 9, 1987, 87 03291
Int. Cl.[4] H02H *3/26*
U.S. Cl. 361—44 **7 Claims**



1. A multipole electrical circuit breaker, protecting an A.C. electrical supply system, including a solid-state trip device, comprising:

a current sensor per pole, which generates a signal proportional to the current flowing through the associated conductor of the supply system protected by the circuit breaker;

a detection and rectification circuit to which said signals are applied to supply on the one hand signals representative of the currents flowing through the conductors to be protected and on the other hand a zero sequence signal if an insulation fault occurs; and

an electronic processing unit to which the output signals from the detection and rectification circuit are applied to perform delayed and/or instantaneous tripping functions and delivering, with or without a time delay, a circuit breaker tripping order when preset thresholds are exceeded by the signals representative of the currents flowing through the conductors or by the zero sequence signal,

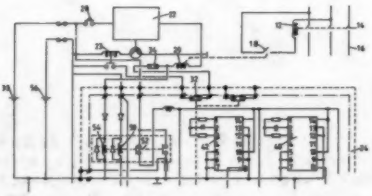
wherein the detection and rectification circuit comprises first rectification means producing a first signal representative of the sum of the positive half-waves of the output signals from the set of current sensors, second rectification means producing a second signal representative, in absolute value, of the sum of the negative half-waves of the output signals from the set of current sensors, and means effecting the difference between the first and second summed signals so as to produce said zero sequence signal.

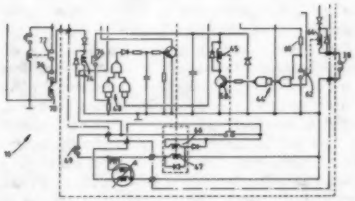
4,899,247

AUTO RECLOSER COIL BURN-OUT PROTECTION

John S. Stewart, Nottingham, United Kingdom, assignor to Brush Switchgear Limited, Loughborough, England

Filed Jul. 6, 1988, Ser. No. 215,731
Claims priority, application United Kingdom, Jul. 7, 1987, 8715934
Int. Cl.[4] H02H *3/07*
U.S. Cl. 361—72 **16 Claims**





1. An auto-recloser for a power line comprising:

main contacts coupled to the power line;

a high voltage closing coil means for closing the main contacts of the auto-recloser in the power line;

non-latching switch means for controlling energising of said closing coil;

a control circuit for generating a closing pulse to close said non-latching switch means; and

circuit means for monitoring the status of said main contacts and preventing energising of said closing coil in response to said main contacts being open a preselected time after generation of said closing pulse;

wherein said control circuit comprises a low voltage coil means for closing said switch means in response to application of said closing pulse; and second switch means controlled by said circuit means for controlling application of said closing pulse to said low voltage coil means; and

wherein said second switch means includes a first, set coil means energisable to actuate said second switch means to prevent application of said closing pulse to said low voltage coil means and a second, reset coil means energisable to reset said second switch means.

4,899,248

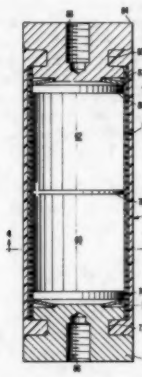
MODULAR ELECTRICAL ASSEMBLIES WITH PLASTIC FILM BARRIERS

Donald E. Raudabaugh, Wadsworth, Ohio, assignor to Hubbell Incorporated, Orange, Conn.

Continuation-in-part of Ser. No. 33,765, Apr. 3, 1987, which is a continuation-in-part of Ser. No. 681,800, Dec. 14, 1984, Pat. No. 4,656,555. This application Mar. 31, 1988, Ser. No. 176,319

Int. Cl.[4] H02H *1/04*

U.S. Cl. 361—127 22 Claims



1. A modular electrical assembly, comprising:

a plurality of conductive electrical components, aligned in a column along an axis and having axially directed ends, said electrical components being electrically connected at said axially directed ends;

a plastic film barrier laterally surrounding and tightly engaging said electrical components;

first and second conductive end members located at opposite ends of said column, said end members having shoulders extending radially relative to said axis; and

a non-conductive filament winding wrapped about said plastic film barrier, said electrical components and said end members, engaging said shoulders and applying an axially directed compressive force through said shoulders on said electrical components and end members to maintain electrical connection therebetween, said plastic film barrier separating said non-conductive filament winding from said electrical components.

4,899,249

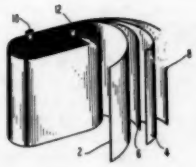
FLUORINE-CONTAINING DIELECTRIC MEDIA AND CAPACITORS EMPLOYING SUCH MEDIA

James L. Reilly, Towamencin; Ludwig K. Huber, Wayne, and Gordon R. Leader, Chester, all of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Apr. 21, 1988, Ser. No. 184,524

Int. Cl.[4] H01G *4/22;* H01B *3/24;* H01F *27/12*

U.S. Cl. 361—317 13 Claims



1. A dielectric medium containing an effective amount of a compound, or mixtures thereof, having one of the following formulae:

$$\text{(c) } R^1(SO_2NR^2R^3)_m, \text{ or (d) } (R^1SO_2N)_mR^2{}_nR^3{}_o$$

wherein R^1 is a saturated or unsaturated alkyl or unsubstituted mono- or polyfunctional hydrocarbon radical having 1 to 12 carbon atoms, a cycloalkyl radical having 3 to 12 carbon atoms, an aryl radical having 6 to 12 carbon atoms or an alkaryl radical having 1 to 6 carbon atoms in the alkyl moiety, said radicals substituted with at least two fluorine atoms, R^2 and R^3 are the same or different and independently selected from saturated and unsaturated alkyl or unsubstituted mono- or polyfunctional hydrocarbon radicals having 1 to 12 carbon atoms, cycloalkyl radicals having 3 to 10 carbon atoms, aryl radicals having 6 to 10 carbon atoms or alkaryl radicals having 1 to 6 carbon atoms in the alkyl moiety, R^2 and R^3 may together form the ring of a single cycloalkyl radical having 3 to 10 carbon atom, m, n and o are independently integers of from 1 to 5.

4,899,250

GAS INSULATED SWITCHGEAR WITH CIRCUIT BREAKERS PERPENDICULAR TO MAIN BUSES

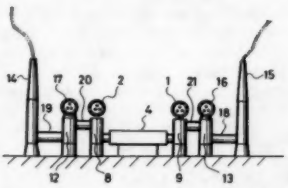
Kosaku Itai, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 14, 1988, Ser. No. 257,759

Claims priority, application Japan, Oct. 26, 1987, 62-271169

Int. Cl.[4] H02B *1/20*

U.S. Cl. 361—341 5 Claims



1. A gas insulated switchgear comprising:

a pair of main buses which are disposed in substantial parallelism with each other;

a plurality of circuit breakers which are parallelly aligned in a spaced defined between said main buses with a substantial right angle to said main buses, said circuit breakers being electrically connected in series with each other between said main buses;

a plurality of connection buses each electrically connecting an adjacent two of said circuit breakers, each of said connection buses being electrically connected to a feeder;

a plurality of main disconnecting switches which are connected to said circuit breakers in series with each other between said main buses, said main disconnecting switches being disposed above extended axial centerlines of said circuit breakers at respective ends of said circuit breakers; and

a plurality of feeder disconnecting switches connecting each of said connection buses to said feeder;

wherein said connection buses connect an adjacent two of said circuit breakers through an adjacent two of said disconnecting switches; and

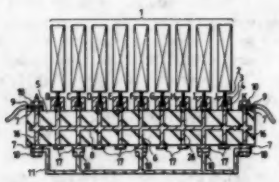
wherein said main buses are disposed above said main disconnecting switches, and said connection buses are disposed above said feeder disconnecting switches.

4,899,251

POWER SUPPLY NETWORK OF PRINTED CIRCUIT BOARD

Tsutomu Imai, and Norio Sengoku, both of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 28, 1988, Ser. No. 264,039
Claims priority, application Japan, Oct. 29, 1987, 62-274432
Int. Cl.[4] H05K 1/00
U.S. Cl. 361—346 20 Claims



1. A power supply network for supplying power to a plurality of loads attached on one of two surface planes of a printed circuit board, comprising:

an internal conductor network on a plane in said printed circuit board;

a plurality of first through hole conductors intersecting said internal conductor network and being electrically connected to at least one of said loads;

at least one horizontal bus attached on the other surface plane of said printed circuit board and being electrically connected within said printed circuit board to said first through hole conductors;

a power supply conductor attached on one of the surface planes of said printed circuit board; and

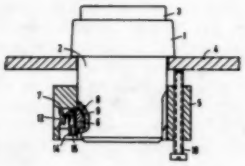
second through hole conductors electrically isolated within said printed circuit board from said internal conductor network and from said first through hole conductors, and said second through hole conductors being electrically connected to said bus and to said power supply conductor so as to minimize dispersions of feeding voltages to said loads fed from said power supply conductor.

4,899,252

MOUNTING FOR A CONTROL DEVICE

Josef Birzer, Schwandorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 2, 1989, Ser. No. 318,072
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1988, 8802896
Int. Cl.[4] H02B 1/04
U.S. Cl. 361—350 6 Claims



1. An arrangement for mounting a control switch mechanism in a control panel;

the control panel having a first side, a second side and a borehole extending between the first side and the second side;

the control switch mechanism including a rim portion and a cylindrical portion, the rim portion resting on the first side of the control panel, the cylindrical portion extending through the borehole and including a plurality of recesses;

a holder, for connecting the cylindrical portion to the second side of the control panel, the holder having a first side facing the second side of the control panel and a second side which is remote from the control panel and the holder including an opening for receiving the cylindrical portion, the holder further comprising a plurality of symmetrically disposed locking bolts, the locking bolts being slidable in a predetermined direction between a first position in which the bolts extend into the opening and a second position in which the locking bolts do not extend into the opening, and a spring associated with each one of the plurality of locking bolts for biasing the locking bolts toward the first position, the locking bolts being movable against the bias of the springs into the second position and each one of the plurality of locking bolts being movable into the opening and into engagement with one of the plurality of recesses formed in the cylindrical portion when the cylindrical portion is received in the opening; and

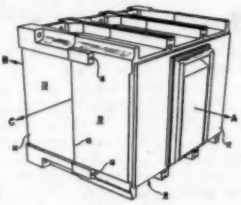
a plurality of clamping bolts, each clamping bolt being screwed into the holder and including a portion engaging the second side of the control panel.

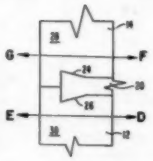
4,899,253

MOLDED CASE CIRCUIT BREAKER HOUSING REINFORCEMENT

Clifford A. Buxton, Lawrenceville, Ga., assignor to Siemens Energy & Automation, Inc., Alpharetta, Ga.

Filed Sep. 19, 1988, Ser. No. 246,470
Int. Cl.[4] H02B 1/04
U.S. Cl. 361—376 6 Claims





1. A circuit breaker having a molded housing, the housing comprising:

a housing reinforcing means; and

a first portion and a second portion, wherein the first and second portions each comprise a first side wall and a second side wall, wall, each side wall having a surface at which the portions are joined, each surface including an elongated groove for accepting the housing reinforcing means, the housing reinforcing means being adapted to rest within the elongated grooves;

the housing reinforcing means comprising:

a first member adapted to rest within the elongated grooves of the first side wall; and

a second member adapted to rest within the elongated

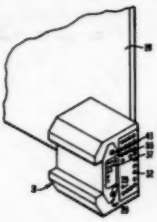
grooves of the second side wall, wherein the first and second members have a substantially dovetail cross-section.

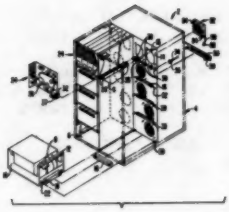
4,899,254

ELECTRONIC MODULE INTERCONNECTION SYSTEM

Joerg U. Ferchau, Morgan Hill; Hoa V. Pham, San Jose, and Randall J. Diaz, Gilroy, all of Calif., assignors to Tandem Computers Incorporated, Cupertino, Calif.

Filed Jul. 22, 1987, Ser. No. 76,458
Int. Cl.[4] H05K *7/20*; H01R *13/629*
U.S. Cl. 361—384 **3 Claims**





1. An electronic system of the type including electronic modules coupled to a power supply and to signal lines, and system comprising:

a housing;

a circuit board mounted within the housing and forming a structural support element of the system, the circuit board including power supply traces and signal traces connected to the power supply and to the signal lines, respectively;

a first blind mateable connector mounted to each of the modules;

second blind mateable connectors mounted to chosen positions on the circuit board for connection with chosen ones of the power supply and signal traces, the second blind mateable connectors configured for mating engagement with respective ones of the first blind mateable connectors;

a fan mounted to the circuit board at a selected position;

the circuit board having an opening at the selected position to allow air to be forced therethrough by the fan, the circuit board configured to divide the housing into sections so the circuit board acts as an air duct barrier; and

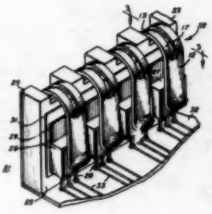
module guide elements for guiding the modules into position adjacent the circuit board so the first and second blind mateable connectors engage one another thus interconnecting the modules with one another and connecting the modules to the power supply and to the signal lines.

4,899,255

HEAT SINK CLIP AND ASSEMBLY AND METHOD OF MANUFACTURE

Maxwell H. Case; Lawrence M. Hartzell, both of New Braunfels, Tex., and David W. Currier, Algonquin, Ill., assignors to Motorola Inc., Schaumburg, Ill.

Filed Jul. 25, 1988, Ser. No. 223,507
Int. Cl.[4] H01L *23/36*
U.S. Cl. 361—386 **30 Claims**



1. A heat sink clip for attaching a power dissipation device to a heat sink, comprising:

a generally U-shaped clip constructed of resilient spring material and having a central apex portion and at least two arm portions forming arms of said U shape, each of said arm portions extending away from associated opposite ends of said central apex portion, respectively, and forming an open end of said clip between said arm portions;

one of said arm portions having a surface thereof for contacting said power dissipation device and biasing it toward said heat sink; and

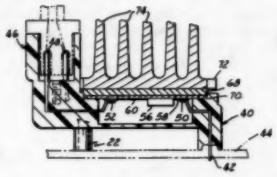
said central apex portion having a slot therein extending through said central apex portion, whereby said slot permits passage of either a portion of said power dissipation device to be heat sunk or permits passage of an insertion tool which facilitates attaching said heat sink clip about said power dissipation device and said heat sink.

4,899,256

POWER MODULE

Min Sway-Tin, Troy, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Jun. 1, 1988, Ser. No. 201,246
Int. Cl.[4] H05K *7/20*
U.S. Cl. 361—386 **9 Claims**



1. A power module comprising:

a housing defining a cavity and including a rim peripherally about said cavity, said rim including a surface and a flange extending from said surface, said surface and flange adapted for receiving and positioning a first conduit board including circuitry onto said housing such that said circuitry is positioned within said cavity;

means for supporting said housing in a spaced relationship with respect to a second circuit board, said means or supporting unitarily formed with said housing;

means for electrically coupling the circuitry of the first circuit board in said cavity with the second circuit board or an electrical system, said electrical means having a

contact portion extending into said cavity adapted to couple with the circuitry on the first circuit board, a contact portion extending from said housing adapted to be coupled with the second circuit board or the electrical system, and the remainder of the electrical means is concealed within said housing such that a portion of the remainder of the electrical means electrically coupling the first and second circuit board is passed through at least one of said supporting means.

4,899,257

ELECTRIC DEVICE WITH AN OPERATION INDICATING LAMP

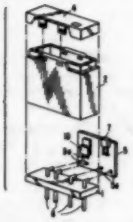
Masato Yamamoto, Imari, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Continuation of Ser. No. 25,744, Mar. 13, 1987, abandoned. This application Apr. 4, 1989, Ser. No. 333,865

Claims priority, application Japan, Mar. 14, 1986, 61-37798[U]

Int. Cl.[4] H05K 1/14

U.S. Cl. 361—395 **8 Claims**



7. An electric device with an operation indicating lamp comprising:

a base member;

a case member including a main frame and a case cover, said main frame being fitted to said base member, and said case cover having an indicating hole therein;

at least one electric component disposed in said case member;

an operation indicating lamp housed within said case member abutting said indicating hole and visible therethrough, said indicating lamp having a diameter which is larger than a diameter of said indicating hole; and

a resin material for fixing said lamp and said electronic component in said case member, said resin material being disposed in a portion of the space provided by said base and said main frame, there being no resin in the vicinity of said indicating hole;

said indicating hole having a tapered opening which tapers toward said indicating lamp.

4,899,258

SOLID ELECTROLYTE CAPACITOR WITH INTEGRAL FUSE

Didier Gouvernelle, Semblancay, France, assignor to Sprague Electric Company, North Adams, Mass.

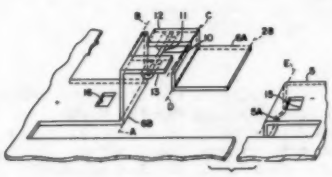
Filed Mar. 16, 1989, Ser. No. 324,131

Claims priority, application France, Jul. 4, 1988, 8809015

Int. Cl.[4] H01G 9/06

U.S. Cl. 361—534 **12 Claims**

1. Solid electrolyte capacitor comprising a capacitor body having two electrodes, two connecting leads provide output terminals each connected to a respective electrode, a fusible member of predetermined length connected in series between said capacitor body and a preselected output terminal, wherein the connecting lead providing said preselected output terminal includes a first section fixed to one of said electrodes and a second section electrically insulated and mechanically separate from said first section and said capacitor body to form said preselected output terminal, and said fusible member alone establishes an electrical connection between said first section



and said second section and is embedded in a rigid thermally insulative support mass of resin and extending between said first section and said second section so as to alone couple them together mechanically in fixed spaced relationship.

4,899,259

ENCASED ELECTRIC COMPONENT

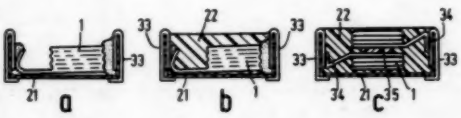
Hendrik Voeten, Zwolle, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 749,370, Jun. 27, 1985, abandoned. This application Sep. 15, 1986, Ser. No. 908,937

Claims priority, application Netherlands, Jul. 17, 1984, 8402251

Int. Cl.[4] H01G 9/00

U.S. Cl. 361—539 **1 Claim**



1. An encased electric component provided with a pair of electrically conductive contacts, situated in a prismatic casing made of an electrically insulating material and separated from the inner surfaces of said casing by an electrically insulating molding material, said casing being open on at least one side, having a wall portion opposed to said open side bonded by two opposing end wall portions and having external contact faces situated at opposing ends of the external surface of said wall portion opposing said open side thereof, which contact faces are conductively connected to said pair of electrically conductive contacts provided on said component, characterized in that each of said external contact faces is part of a strip of conductive material extending along one of said ends, along the external surface of an adjacent end wall portion, along the external surface of an edge of said end wall portion adjacent to said open side and folded inwardly to extend along the inner surface of said adjacent end wall portion thereby to form a contact face inside of said casing and in that the electrically conductive contacts of the component are secured to the contact faces by means of a lacquer which has been rendered conductive and which has been cured by means of UV radiation.

4,899,260

OPTICAL CONDUCTOR BODY FOR ILLUMINATING INDICATION ELEMENTS OF ELECTRICAL APPARATUSES

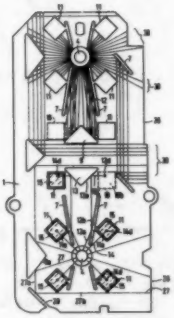
Manfred F. L. Schrammek, Wetzlar, and Mathias Sprengart, Wetzlar-Nauborn, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 2, 1988, Ser. No. 266,176

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1987, 3737514

Int. Cl.[4] F21V *7/04*

U.S. Cl. 362—32 15 Claims



1. An optical conductor body for illuminating indication elements of an electrical apparatus from the inside comprising:

a plate of optically transmissive material, having a substantially planar surface which plate is arranged behind element parts to be illuminated and through which light beams pass from at least one illumination source by total reflection within the plate to the areas to be illuminated and are conducted by deflection at reflection surfaces to the individual areas to be illuminated;

the optical conductor body (1) comprises a plate (1) with a substantially planar surface,

openings (7,8,9) at least one opening extending transversely through the plate and having walls extending at right angles to a central plane (5) of the plate and at an acute angle to the course of the light beam for reflecting the light beams in a direction parallel to the central plane (5) of the plate within the plate; and at least one recess formed in the plate having a reflection surface (10b) inclined with respect to the central plane (5) of the plate for reflecting a light beam out of the plate in a direction away from the body.

4,899,261

AUTOMOBILE HEADLAMP WITH SMALL HEIGHT AND HIGH FLUX RECOVERY

Eric Blusseau, Les-Pavillons-sous-Bois, and Norbert Brun, Bobigny, both of France, assignors to Cibie Projecteurs, Bobigny Cedex, France

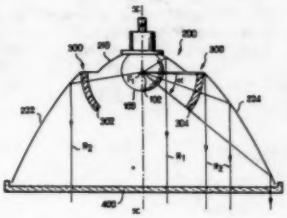
Filed Oct. 13, 1988, Ser. No. 257,211

Claims priority, application France, Oct. 13, 1987, 87 14114

Int. Cl.[4] F21V *13/04*

U.S. Cl. 362—61 11 Claims

1. A headlamp for an automobile vehicle, of the kind comprising a light source, a reflector defining an optical axis, and a closing glass, wherein the reflector comprises a base part substantially in the form of a paraboloid of revolution focussed on the light source, and side pieces in the form of parabolic cylinders having a vertical generatrix, and said headlamp further comprises a deflecting means extending near the source substantially over the full height of the headlamp and adapted to deflect the direction of the light rays coming from the source in order to re-emit them in an essentially horizontal direction towards the said side pieces of the reflector, which in turn



reflect them in a direction essentially parallel to the optical axis to participate in the formation of the beam.

4,899,262

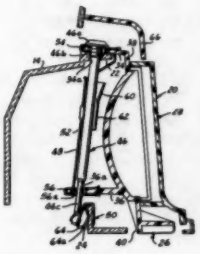
ATTACHMENT ARRANGEMENT FOR VEHICLE TAIL LAMP ASSEMBLY

Kenneth W. Hammond, Detroit; Herbert W. Gilbert, Royal Oak, and Gerald E. Swierb, Plymouth, all of Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Feb. 13, 1989, Ser. No. 308,925

Int. Cl.[4] B60Q *1/26*

U.S. Cl. 362—80 10 Claims



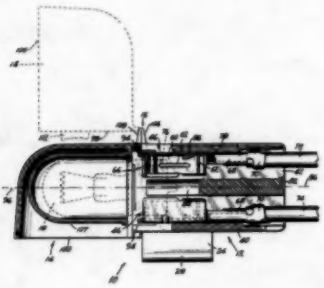
1. In an automobile vehicle provided with a rearwardly projecting mounting flange, an upwardly extending mounting bracket, a spring clip mounted on said bracket and having a resilient leg extending therefrom, a lamp assembly having a top, a bottom, and forwardly projecting upper and lower locating flanges, said flanges having generally vertically aligned apertures therethrough, and mounting means for mounting the lamp assembly to said vehicle, said mounting means including an elongated threaded shaft having a body portion extending generally vertically downwardly through the apertures and an end portion which engages the spring leg, the mounting means characterized by: fastener means for rigidly securing the top of said assembly to said vehicle such that the bottom thereof is free to move in a horizontal direction towards said vehicle, a one-piece clip member having an upper and a lower clip portion, secured, respectively, to one and the other locating flanges, the shaft passing through the clip portions, and means for fixedly securing the shaft to said upper clip portion.

4,899,263

LAMP FIXTURE FOR ILLUMINATING INTERIOR OF CIGAR LIGHTER SOCKET

Peter J. Lapoli, Hamden; Donald J. Mattis, Norwalk, and Robert S. Miller, Stratford, all of Conn., assignors to Casco Products Corporation, Bridgeport, Conn.

Filed Nov. 2, 1984, Ser. No. 667,559
Int. Cl.[4] B60Q *3/04*
U.S. Cl. 362—80 **27 Claims**



1. A one-piece resilient plastic lamp unit for attachment to the socket of an electric cigar lighter for automobiles and other conveyances, comprising in combination:

(a) a receptacle body portion having means for supporting a lamp at one exterior surface thereof,

(b) a hood portion disposed adjacent the said exterior surface of the body portion, said hood portion having open sides to provide for the passage of said lamp thereinto, and

(c) a "living" hinge integral with and connecting said body and hood portions to each other,

(d) said hinge being joined to the hood portion at an edge thereof which borders one of its open sides, and being joined to said body portion at an edge of said exterior surface thereof,

(e) said one open side of the hood portion being spanned by the exterior surface of the body portion, and said hood and body portions essentially constituting continuations of each other when the hood portion is enclosing a lamp supported by the body portion,

(f) another of the open sides of said hood portion constituting a window through which light rays from the lamp can pass when the hood portion is enclosing the lamp.

4,899,264

DRYER DRUM LAMP ASSEMBLY

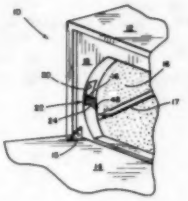
Stuart W. Ries, St. Joseph Township, Berrien County, and Irene M. Shembarger, Berrien Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jul. 18, 1989, Ser. No. 381,575
Int. Cl.[4] F21V *33/00*
U.S. Cl. 362—92 **20 Claims**

1. A lamp assembly for use in a clothes dryer, said clothes dryer including a rotatable drum and a cabinet for housing said drum, said cabinet including an aperture in one wall thereof and a cover for said aperture, said lamp assembly comprising:

a lamp socket;

bracket means for pivotably supporting said lamp socket, said bracket adapted to be secured to a said cabinet whereby said lamp socket may be pivoted from a servicing position in which a lightbulb installed in the socket extends through said aperture to an operating position away from said aperture wherein the lightbulb illuminates the interior of a said drum; and



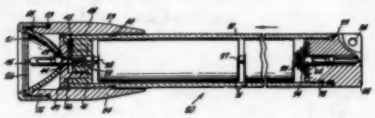
interference means connected to said lamp socket for permitting installation of a said cover over said aperture only if said lamp socket is in said operating position.

4,899,265

MINIATURE FLASHLIGHT

Anthony Maglica, Ontario, Calif., assignor to Mag Instrument, Inc., Ontario, Calif.

Continuation of Ser. No. 34,918, Apr. 6, 1987, abandoned, which is a continuation of Ser. No. 828,729, Feb. 11, 1986, Pat. No. 4,658,336, which is a continuation of Ser. No. 648,032, Sep. 6, 1984, Pat. No. 4,577,263. This application Jul. 19, 1988, Ser. No. 222,378
The portion of the term of this patent subsequent to Aug. 18, 2003, has been disclaimed.
Int. Cl.[4] F21L *7/00*
U.S. Cl. 362—187 **13 Claims**



1. A flashlight comprising:

a barrel for retaining at least one dry cell battery;

a lamp bulb having a filament;

bulb holding means positioned adjacent one end of the barrel and adapted to locate the bulb filament axially beyond the one end of the barrel;

a substantially parabolic reflector;

a substantially planar lens;

means for retaining the reflector and the lens being engageable with the barrel at the end of the bulb holding means is positioned and adapted to be controllably translatable along the barrel such that the relative positional relationship between the reflector and the lamp bulb may be varied, thereby varying a reflection dispersion of a light beam emanating through the lens from said lamp bulb;

means for electrically coupling a center electrode of one of the batteries to a first electrode of the lamp bulb; and

means for electrically coupling a case electrode of one of the batteries to a second electrode of the lamp bulb;

wherein relative motion of the head means for retaining the reflector and the lens in an axial direction away from the barrel closes an electrical contact of one of the coupling means and further relative motion in said same axial direction separates said means for retaining the reflector and the lens from the barrel to expose the lamp bulb and thereby permits the dispersion of substantially spherical illumination.

4,899,266

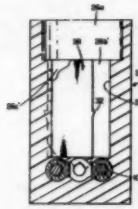
MINIATURE LIGHT SETS AND LAMPHOLDERS AND METHOD FOR MAKING THEM

Joseph M. Ahroni, 2701 W. Manor Pl., #204, Seattle, Wash. 98199

Continuation-in-part of Ser. No. 131,027, Dec. 10, 1987, Pat. No. 4,807,098, which is a continuation-in-part of Ser. No. 945,602, Dec. 22, 1986, Pat. No. 4,779,177, which is a continuation-in-part of Ser. No. 664,153, Oct. 24, 1984, Pat. No. 4,631,650. This application Dec. 22, 1988, Ser. No. 290,239

Int. Cl.[4] F21V *33/00*

U.S. Cl. 362—238 24 Claims



1. In a method for making a lighting string:
providing a multiwire insulated cord;
forming a cutout in one wire of said cord;
enclosing said cutout and the adjacent portions of the cord in a multipart mold for a lampholder;
introducing plastic into said mold to form a lampholder on the cord which houses said cutout and adjacent portions of the cord and presents a lamp socket exposed to the cord at opposite ends of said cutout and adapted to receive two push-in contact members and a push-in lamp; and
freeing the molded lampholder and cord from the mold.

4,899,267

SPOTLIGHT AND CONTROL SYSTEM THEREFOR

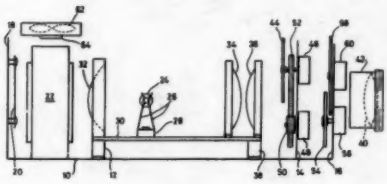
Paul F. Mardon, Fulbourn, Great Britain, assignor to Pulsar Light of Cambridge Ltd, Cambridge, England

Filed Dec. 29, 1988, Ser. No. 290,363

Claims priority, application United Kingdom, Mar. 9, 1988, 8805581; Apr. 19, 1988, 8809216

Int. Cl.[4] F21V *11/08*

U.S. Cl. 362—277 10 Claims



1. A spotlight having n adjustable parameters, comprising a housing and, for each adjustable parameter) a bipolar electric stepper motor mounted within the spotlight housing, and wherein there is provided a first control signal input means by which n different analogue electrical signals for the spotlight may be used to control the rotational position of the n different stepper motors, to allow remote control of the n different parameters, a second control signal input means by which a single transmission path carrying control signals as a serial datastream can be connected to the spotlight, and receiver means associated with the second signal input means and adapted only to respond to a precursor of one particular data stream, so that the spotlight may be uniquely addressed from a remote control means, which generates the appropriate precursor and transmits thereafter the requisite data as a serial data stream, thereby to alter one or another or all of the n controllable parameters of the spotlight by using n different channels within the transmitted data.

4,899,268

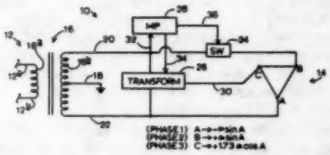
FREQUENCY-DEPENDENT SINGLE-PHASE TO THREE-PHASE AC POWER CONVERSION

Theodore G. Hollinger, Redmond, Oreg., assignor to APC-Onsite, Inc., Redmond, Oreg.

Filed May 10, 1989, Ser. No. 351,080

Int. Cl.[4] H02M *5/00*

U.S. Cl. 363—4 4 Claims



1. Apparatus for supplying to a three-phase electrical load including three input terminals, operating power from a single-phase, known-frequency, sinusoidal power source including two output terminals, said apparatus, in operative condition, comprising
means operatively connecting each of a first and second of such input terminals with a different one of such output terminals of the direct supply to the latter of voltage from the former, and
electronic means operatively connected both to such two output terminals and to the third input terminal for supplying the latter with a sinusoidal voltage artifact matching the frequency of the source and having an amplitude which is a predetermined absolute value greater than that of the source.

4,899,269

SYSTEM FOR REGULATING THE OPERATING POINT OF A DIRECT CURRENT POWER SUPPLY

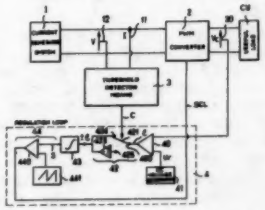
Christian Rouzies, Toulouse, France, assignor to Centre National D'Etudes Spatiales, Paris, France

Filed Jan. 24, 1989, Ser. No. 300,923

Claims priority, application France, Jan. 29, 1988, 88 01057; Jul. 18, 1988, 88 09682

Int. Cl.[4] G05F *1/67*

U.S. Cl. 363—41 14 Claims



1. System for regulating the operating point of a direct current power supply comprising a current generator system and a pulse width modulation converter connected to said current generator system, said regulation system comprising:
means for sampling and measuring the current and voltage supplied by said current generator system to said con-

verter and adapted to provide a signal representing said current and voltage,

threshold detector means for sensing stalling of said converter connected to receive said signal representing said current and voltage supplied by said current generator system and adapted to provide a logic signal representing the stalled or non-stalled state of said converter relative to defined threshold values of said threshold detector means, and

a loop for regulating the width of pulses supplied by said converter and comprising:

means for sampling and measuring the voltage supplied by said converter to a load,

differential amplifier means connected to receive on a first input said signal supplied by said means for measuring the voltage supplied by said converter and on a second input a first reference signal and adapted to provide an amplified error signal,

inverter means comprising an input connected to receive said amplified error signal and an inversion control input connected to receive said logic signal supplied by said threshold detector means and adapted to provide an inverted or non-inverted error signal,

integrator means connected to receive said inverted or non-inverted error signal and adapted to provide an integrated error signal, and

pulse width modulator means comprising a sawtooth signal generator and a first comparator having a first input connected to receive from said integrator means said integrated error signal, a second input connected to receive the signal supplied by said sawtooth signal generator and an output adapted to provide a pulse width control signal to said pulse width modulation converter.

4,899,270

DC-TO-DC POWER SUPPLY INCLUDING AN ENERGY TRANSFERRING SNUBBER CIRCUIT

Eric D. Bond, Burnaby, Canada, assignor to Statpower Technologies Corp., Burnaby, Canada

Filed Mar. 14, 1989, Ser. No. 322,903
Int. Cl.[4] H02H 7/122
U.S. Cl. 363—56 **15 Claims**

1. A direct current to direct current power including:

(a) a power conductor and a reference conductor connectable to a power source;

(b) flux producing means for producing a changing magnetic flux and for producing a first potential, the flux producing means including a first inductor and a switching element for interrupting electric current flow through the first inductor, the first inductor and the switching element being connected in series with the power conductor and the reference conductor;

(c) a first capacitor for storing electric charge and for developing a second potential in response to the stored electric charge, the first capacitor being connected to the reference conductor;

(d) first means for permitting electric current flow from the producing means to the first capacitor and for blocking electric current flow from the first capacitor to the producing means, the first means being connected between the producing means and the first capacitor;

(e) a second inductor for inducing a third potential in response to the changing magnetic flux, the second inductor being magnetically coupled to the producing means and being connected in series with the first capacitor to add the second potential to the third potential to produce a combined potential;

(e) an output conductor for supplying an output current at an output voltage to a load connected between the output conductor and the reference conductor;

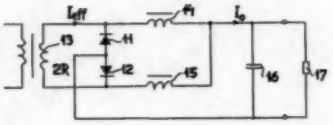
(f) second means for permitting electric current flow from the second inductor to the output conductor and for blocking electric current flow from the output conductor to the second inductor, the second means being operatively connected to the second inductor and the output conductor.

4,899,271

POWER SUPPLY CIRCUIT

Ole S. Selersen, Horsholm, Denmark, assignor to Scanpower, Horsholm, Denmark

Filed Jul. 21, 1988, Ser. No. 222,207
Claims priority, application Denmark, Jul. 22, 1987, 3826/87
Int. Cl.[4] H02M 7/06
U.S. Cl. 363—126 **3 Claims**



1. A power supply circuit comprising a transformer including a secondary winding having two secondary winding ends, and a pair of rectifier diodes each diode having a first type of electrode and a second type of electrode, each of the diodes having a first type of its electrodes connected directly to a respective one of the secondary winding ends, the second electrode of each of the diodes being connected to a first output terminal of the power supply circuit,

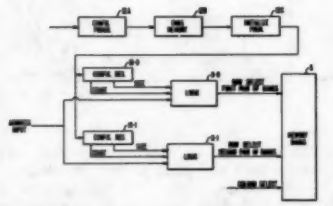
characterized in that the power supply circuit further comprises two reactive components wherein the first type electrodes of the diodes are further connected to the second output terminal of the power supply circuit via a respective one of the reactive components such that the sum of the current through the diodes is substantially equal to the output current, and that the reactive components are dimensioned such that one reactive component sends current through one diode serving as a free-wheeling diode, while the secondary winding of the transformer sends current through the same diode.

4,899,272

ADDRESSING MULTIPLE TYPES OF MEMORY DEVICES

Michael G. Fung, San Jose, and Justin Wang, Saratoga, both of Calif., assignors to Chips & Technologies, Inc., San Jose, Calif.

Filed Oct. 23, 1987, Ser. No. 112,967
Int. Cl.[4] G11C 8/00, 7/00; G06F 1/00, 11/00
U.S. Cl. 365—230.03 **14 Claims**



1. A memory addressing system for a memory that has a plurality of banks of memory devices having a first and a second size, comprising:

means for supplying address signals to said memory banks and for generating row and column accessing signals for said memory;

a plurality of hardware configuration registers, each associated with at least one of said memory banks;

means for programming said configuration registers to indicate the type of memory devioce that have been inserted in the particular memory banks and to indicate the starting address of the particular set of memory banks; and

logic means, having inputs coupled to said means for supplying address signals and at least one of said configuration registers, for using the information in said configuration register to modify said accessing signals;

whereby it is not necessary to insert the largest memory devices in the physical first memory banks and whereby memory devices of either size can be inserted in either set of memory banks.

4,899,273

CIRCUIT SIMULATION METHOD WITH CLOCK EVENT SUPPRESSION FOR DEBUGGING LSI CIRCUITS

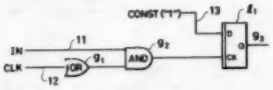
Koichiro Omoda, Sagamihara; Shunsuke Miyamoto, Tokyo; Takayuki Nakagawa; Yoshio Takamine, both of Kokubunji; Shigeo Nagashima, Hachioji; Masayuki Miyoshi, Hadano; Yoshiharu Kazama, Hadano, and Yoshiaki Kinoshita, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 10, 1986, Ser. No. 940,539

Claims priority, application Japan, Dec. 11, 1985, 60-276761

Int. Cl.[4] G06F *9/44, 11/22, 11/26*

U.S. Cl. 364—200 **2 Claims**



1. A logic simulation method for computing, by means of a computer, the variation of the output of at least one latch of a clock-synchronized logic circuit which includes a combination logic circuit having a plurality of logic gates and which is connected to receive at least one input signal and a plurality of clock signals of different phases, said latch being responsive to the output of said combination logic circuit in response to the rise or fall of said clock signals for latching said combination circuit output, comprising the steps of:

(a) determining whether the outputs of said logic gates have the value 0 to 1 and determining a function of the signal values of one of said clock signals, on the basis of the initial value of said input signal, the logic function of each of said logic gates, and connection information between each of said logic gates and another logic gate or clock signal source;

(b) calculating the output of each of said logic gates at each of a plurality of sampling instants for each of a plurality of machine cycles which coincide with the rise or fall of a first phase clock signal, including judging whether or not said input signal has varied during a time period between sampling instants, and calculating said outputs only when said input signal has varied for such one of said logic gates as is possibly susceptible to the influences of the variation of said input signal;

(c) calculating the output of said latch at each of said sampling points from both the value of such outputs calculated at said step (b) as have been inputted to the latch and a predetermined function to be executed by said latch at each of said sampling points, including calculating, when said output value is a function of the value of one of said clock signals, the output of said latch on the basis of the signal value, which relates to said one clock signal at each of said sampling points, and said function of the latch; and

(d) repeating said steps (b) and (c) in response each of the clock signals of different phases.

2. A logic simulation method according to claim 1, wherein said step (b) further include the sub-steps of;

(e) calculating the output of a first one of said logic gates, to which said input signal is fed, and comparing said output with the output calculated at a preceding sampling instant;

(f) calculating the output of a second one of said logic gates, to which the output of said first logic gate is fed as an input, and comparing said output with the output of said second logic gate, which has been detected at a previous sampling instant;

(g) conducting a comparison of the output of a third one of said logic gates, to which the output of said second logic gate is fed as an input, when an inconsistency is detected as a result of the comparison at said step (f);

(h) sequentially executing similar processings for succeeding ones of said logic gates each time an inconsistency is detected as a result of the comparison of said step (g); and

(i) interrupting the executions of said steps (f), (g) and (h),.respectively, when the inconsistencies are detected at the respective comparisons of said steps (e), (f) and (g).

4,899,274

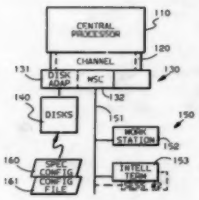
DYNAMIC TERMINAL ADDRESS ALLOCATION BY THE TERMINAL ITSELF IN A DATA PROCESSING SYSTEM

Barry W. Hansen, Rochester, and Raymond F. Romon, Oronoco, both of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 789,798, Nov. 21, 1985, abandoned. This application May 2, 1989, Ser. No. 348,143

Int. Cl.[4] G06F *7/00*

U.S. Cl. 364—200 **12 Claims**



1. In a data-processing system having a central processor and multiple terminals connected thereto by a common communications medium, wherein all of said terminals require mutually different terminal addresses for passing data to and from said processor over said medium, and wherein each of said terminals includes microprocessor, memory, and input-/output means all interconnected by a bus, a combination physically located in at least one of said terminals for assigning a terminal address to said one terminal, comprising:

(a) a terminal controller coupled to said bus and having enabled and disabled states, said controller being coupled to said medium and adapted when in said enabled state to pass signal frames, containing both address bits and data bits representing character codes and commands, between said terminal and said processor using a predetermined one of said terminal addresses as the address of said one terminal;

(b) means for setting said controller to said disabled state;

(c) means coupled to said communication medium for detecting which ones of said terminal addresses have been transmitted on said communications medium;

(d) a table containing a set of candidate terminal addresses selected from said mutually different terminal addresses;

(e) an emulator for comparing said candidate terminal addresses with said terminal addresses transmitted on said medium, and for assigning as said predetermined one of said terminal addresses, one of said candidate addresses other than said terminal address detected by said detecting means, and thereafter for setting said controller to said

enabled state, said emulator being further adapted for processing said data bits;

(f) arbiter means capable of assigning any of multiple groups of addresses in an address space of said microprocessor for coupling said controller to said bus;

(b) latch means coupled to said arbiter for specifying one of said multiple groups of addresses.

4,899,275

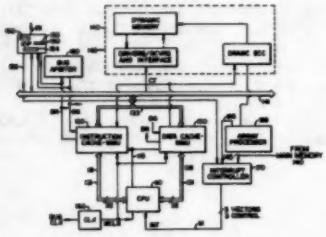
CACHE-MMU SYSTEM

Howard G. Sachs, Los Altos; James Y. Cho, Los Gatos, and Walter H. Hollingsworth, Campbell, all of Calif., assignors to Intergraph Corporation, Huntsville, Ala.

Continuation of Ser. No. 915,120, Oct. 3, 1986, abandoned, which is a continuation-in-part of Ser. No. 704,497, Feb. 22, 1985, abandoned. This application May 1, 1989, Ser. No. 346,251

Int. Cl.[4] G06F *13/00*

U.S. Cl. 364—200 54 Claims



1. In a computer having a processor and an addressable primary memory for storing digital system information, an integrated cache memory management system comprising:

an addressable read-write cache memory for storing digital system information;

a tag memory for storing an associative map of addresses corresponding to digital system information presently stored in the cache memory;

comparator means, coupled to the tag memory and to the processor, for providing a hit signal responsive to the correspondence of an address received from the processor to a presently mapped cache memory addressable location, and for providing a miss signal responsive to a determination of a lack of such correspondence;

memory controller means, coupled to the primary memory and to the cache memory, for communicating digital system information between the primary memory and the cache memory;

access controller means for communicating digital system information between the cache memory and the processor responsive to a hit signal; and

processor interface means, coupled to the access controller means and to the processor, the processor interface means including a plurality of serially interconnected registers coupled to the access controller means and to the processor for storing a stack of digital system information for serial transfer of the stored digital system information at high speed from the access controller means to the processor.

4,899,276

FIELD-DIRECTED SCREEN HELP TECHNIQUE

Fred Stadler, Tarrant County, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 14, 1984, Ser. No. 640,743

Int. Cl.[4] G06F *3/14*

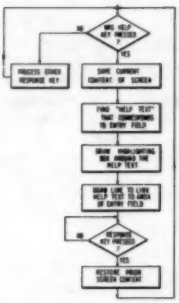
U.S. Cl. 364—300 3 Claims

1. In a data entry system which employs data entry screens and a save area for saving data describing a current data entry screen, said data entry screens comprising a plurality of fields in which a user enters data, corresponding labels identifying the fields, and a label identifying a current data entry field in which the user is next to enter data, said system storing help text associated with each data entry field label, a field-directed screen help technique comprising the steps of:

monitoring an input from the user requesting help,

when a request for help is detected, saving the data describing the current data entry screen in the save area,

using the current data entry field label, determining the current data entry field and the help text for that data entry field,



displaying the help text on the current data entry screen at a location which obscures part of the data entry screen but not the current data entry field,

drawing a box around the help text and drawing a line from the box to the current data entry field to link the help text to the current data entry field on the data entry screen, and

restoring the prior data entry screen by reading the data entry screen in the save area to the screen when the user presses a response key.

4,899,277

BORE HOLE SCANNER WITH POSITION DETECTING DEVICE AND LIGHT POLARIZERS

Yunosuke Iizuka; Takashi Ishii; Yoshihiro Mukawa; Kouji Nagata, all of Tokyo; Yoshitaka Matsumoto, Yokohama, and Osamu Murakami, Funabashi, all of Japan, assignors to Shimizu Construction Co., Ltd. and Core Inc., both of Tokyo, Japan

Filed Oct. 28, 1988, Ser. No. 263,950

Claims priority, application Japan, Oct. 30, 1987, 62-275545

Int. Cl.[4] G02B *23/26*

U.S. Cl. 364—422 2 Claims

1. A bore hole scanner for observing a bore hole wall by continuously imaging the bore hole wall by an image pick-up means accommodated in a sonde which is raised and lowered in the bore hole, said bore hole scanner comprising:

light projecting means for projecting a light beam toward the bore hole wall;

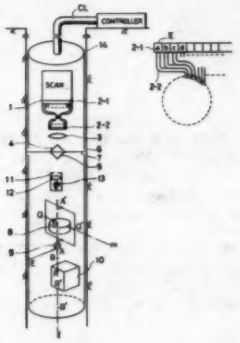
a conical mirror, arranged coaxially with respect to said sonde, for condensing light reflected from the bore hole wall;

image forming means arranged in front of said conical mirror;

photoelectric transducing means for converting a light signal into an electric signal, said photoelectric transducer means comprises sets, each set having respective polarizing functions corresponding to three primary colors of light;

optical fibers for introducing an image, by said image forming means, to said photoelectric transducing means, said optical fibers formed in concentric circles;

data processing means for scanning and extracting signals from said photoelectric transducing means, and for generating and processing image data indicative of the bore hole wall surface; and



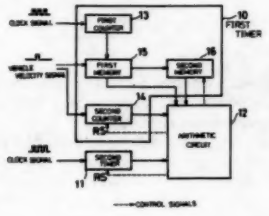
sonde position detecting means for detecting orientation and position of the sonde.

4,899,278

AUTOMATIC TRANSMISSION WITH ERRONEOUS SHIFT PREVENTING FUNCTION

Masanari Yamamoto; Yasunobu Ito, and Kenji Suzuki, all of Anjo, Japan, assignors to Aisin-Warner Kabushiki Kaisha, Aichi, Japan

Filed Aug. 10, 1987, Ser. No. 83,391
Claims priority, application Japan, Aug. 11, 1986, 61-188196
Int. Cl.[4] B60K *41/18*; G06F *15/20*
U.S. Cl. 364—424.1 **6 Claims**



1. An automatic transmission with shift solenoids controlled by a microcomputer in dependence upon a signal indicative of vehicle velocity and a signal indicative of throttle opening and having an erroneous shift preventing function at very low speeds, comprising:

a vehicle velocity sensor for outputting a pulsed signal the period of which varies in dependence upon vehicle velocity;

a first timer for measuring time required for a predetermined number of pulses to enter from said vehicle velocity sensor;

a second timer for counting clock pulses; and

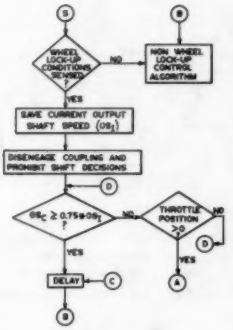
an arithmetic circuit for selectively calculating vehicle velocity and for providing said calculating vehicle velocity to said microcomputer as a vehicle velocity signal for actuating said shift solenoids based on a value measured by said first timer only when a value measured by said second timer is less than a predetermined value indicating very low vehicle velocity.

4,899,279

METHOD FOR CONTROLLING AMT SYSTEM INCLUDING WHEEL LOCK-UP DETECTION AND TOLERANCE

William F. Cote, Farmington Hills, and Robert R. Smyth, Bloomfield Hills, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Apr. 7, 1986, Ser. No. 848,610
Int. Cl.[4] B60K *41/02*
U.S. Cl. 364—424.05 **15 Claims**



1. A control method for controlling a vehicular automatic mechanical transmission system utilized in connection with a vehicle equipped with vehicle wheel brakes for retarding the rotation of at least one of the vehicle drive wheels, said automatic mechanical transmission system comprising a throttle-controlled engine, a change gear transmission having a plurality of gear ratio combinations selectably engagable between a transmission input shaft and the transmission output shaft, said transmission output shaft drivingly coupled to said vehicle drive wheels, and a disengagable coupling drivingly interposed said engine and said transmission input shaft, said automatic mechanical transmission system additionally comprising an information processing unit having means for receiving a plurality of input signals including (1) an input signal indicative of the rotational speed of said transmission output shaft, and (2) an input signal indicative of operator set throttle position, said processing unit including means for processing said input signals in accordance with a program to provide a predetermined gear ratio for a given combination of input signals and for generating command output signals whereby said transmission system is operated in accordance with said program, and means associated with said transmission system effective to actuate said transmission system to effect engagement of one of said gear ratio combination in response to said output signals from said processing unit, the method characterized by:

sensing the presence of a wheel lock-up condition; and

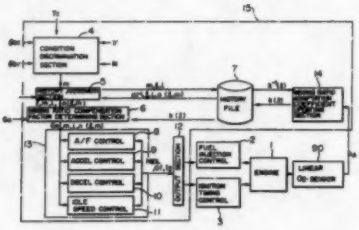
if the presence of a wheel lock-up condition is sensed, causing said coupling to be immediately disengaged, and then processing said input signals to determine if said previously sensed existing or impending wheel lock conditions have terminated if, after sensing the presence of a wheel lock-up condition, the sensed throttle position exceeds a predetermined minimum reference value.

4,899,280

ADAPTIVE SYSTEM FOR CONTROLLING AN ENGINE ACCORDING TO CONDITIONS CATEGORIZED BY DRIVER'S INTENT

Mikihiko Onari, Kokubunji; Teruji Sekozawa, Kawasaki, and Motohisa Funabashi, Sagamihara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 8, 1988, Ser. No. 179,542
Claims priority, application Japan, Apr. 8, 1987, 62-84743
Int. Cl.[4] F02B *3/00*; F02D *41/34*
U.S. Cl. 364—431.05 **11 Claims**



1. An adaptive control system for controlling an engine of a vehicle in a plurality of categorized conditions, comprising:

a plurality of driving operation sensors for detecting a driving operation of the vehicle taken according to a driver's intent;

a plurality of operating condition sensors including a linear oxygen sensor for detecting operating conditions of the vehicle and the engine;

a plurality of actuators for controlling means for operating the engine;

condition discrimination means for determining one of engine control conditions from the detected results of the driving operation sensors and the operating condition sensors;

a history file for storing past engine control conditions;

history judgment means for judging whether the engine control condition at present is in a continuation of same engine control condition or in a transition process between different engine control conditions by comparing a past engine control condition retrieved from the history file with the engine control condition determined by the condition discrimination means;

control parameter determining means for determining engine control parameters from the result of judgment of the history judgment means and from an adaptive parameter retrieved from the history file updating means by use of a weighting process corresponding to a degree of transition between control conditions when the history judgment means judges that the engine is in said transition process between different ones of said plurality of engine control conditions, wherein the degree of transition between said different ones of said plurality of engine control conditions is determined from the ratio between a predetermined number of engine detonations needed for a smooth transition between said different ones of said plurality of engine control conditions and a number of engine detonations that has occurred from a first detonation at the start of said transition process;

control means having a plurality of control modes corresponding to said control conditions for applying an operating signal to each of the plurality of actuators on the basis of the control parameters determined by the control parameter determining means in each control mode in accordance with the engine control condition discriminated by the condition discrimination means; and

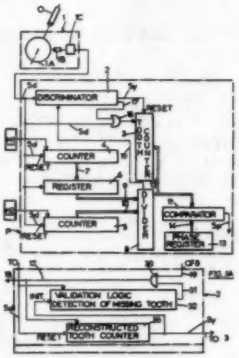
adaptive parameter updating means for receiving a control response parameter from the output of the operating condition sensors and for calculating an updated value of the adaptive parameter and for storing the updated value of said adaptive parameter in the history file.

4,899,281

DEVICE FOR TRIGGERING AN EVENT IN PHASE WITH AN ANGULAR POSITION OF A ROTARY COMPONENT AND APPLICATION THEREOF

Jean-Michel Grimaud, Grenade, and Jean-Marc Nozeran, Toulouse, both of France, assignors to Bendix Electronics S.A., Toulouse, France

Filed Jul. 22, 1988, Ser. No. 223,209
Claims priority, application France, Jul. 24, 1987, 87 10539
Int. Cl.[4] F02P *5/04*, *17/00*
U.S. Cl. 364—431.04 **12 Claims**



1. A device for triggering an event in phase with a predetermined angular position of a component (θ) driven to execute a rotational movement, comprising:

angular encoding means delivering a pulsed input signal (Sd) in phase with equal angular steps of the component,

means for delivering a synchronizing signal (Sy, S'y) in response to the passage of the component through at least one angular reference position, and

electronic circuits for utilizing said signals ensuring the triggering of the event at the position determined by counting the pulses of the input signal, wherein the electronic circuits comprise:

an angular counter incremented from zero by the input signal (Sd) and reset to zero by the synchronizing signal (Sy, S'y) to exhibit permanently on its outputs a condition which is the image of the instantaneous angular position of the component in relation to the reference position,

at least one memory circuit in which there is stored a number representing the predetermined angular position in relation to the reference position,

means for loading said at least one memory circuit with such a number at a time that is independent of the angular position of the component, and

at least one comparator which permanently compares the condition of the outputs of said angular counter with that of the outputs of said memory circuit and which delivers a signal for triggering an event (Sp) in response to the detection of a coincidence between said conditions.

4,899,282

METHOD AND APPARATUS FOR CONTROLLING AN INTERNAL COMBUSTION ENGINE

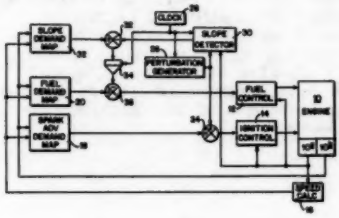
Michael Holmes, Birmingham, England, assignor to Lucas Industries public limited company, Birmingham, England

Continuation-in-part of Ser. No. 888,067, Jul. 22, 1986, Pat. No. 4,843,556. This application Feb. 20, 1987, Ser. No. 16,790

Claims priority, application United Kingdom, Jul. 23, 1985, 8518593; Feb. 20, 1986, 8604259; Feb. 20, 1986, 8604260

Int. Cl.[4] F02D *37/02*

U.S. Cl. 364—431.08 **36 Claims**



1. A system for determining an internal combustion engine input control parameter, said system comprising:

means for determining a first engine operating parameter;

means for determining a second engine operating parameter;

means for determining a basic value for an engine input control parameter in accordance with a fixed map;

a correction map means for storing correction values for said input control parameter as a two-dimensional array as a function of said two engine operating parameters

means for providing a calculated correction value for said two prevailing engine operating parameters, said providing means includes means for multiplying each of n correction values stored in said correction map means at n array points in said two-dimensional array which surround the prevailing engine operating parameters, by respective weighting factors to provide n product values and then summing said n product values to produce a calculated correction value;

means for determining a command value for said input control parameter by summing said basic value and a calculated correction value; and

means for updating said values stored in said correction map means, said updating means comprising means for producing a series of error values, multiplying each error value by a respective weighting factor for each of n array points surrounding the prevailing engine operating parameters to form n product values, and using said n product values to update said correction values stored at said n array points, said weighting factors being related to the distance of the prevailing engine operating parameters from the n array points respectively, and calculating said weighting factor for each array point in relation to its distance from the prevailing engine operating parameters, wherein n is an integer greater than 2.

4,899,283

TOMOGRAPHIC APPARATUS INCLUDING MEANS TO ILLUMINATE THE BOUNDED FIELD OF VIEW FROM A PLURALITY OF DIRECTIONS

Martin Annis, Cambridge, Mass., assignor to American Science and Engineering, Inc., Cambridge, Mass.

Filed Nov. 23, 1987, Ser. No. 123,630

Int. Cl.[4] G06F *15/38*

U.S. Cl. 364—413.15 **16 Claims**

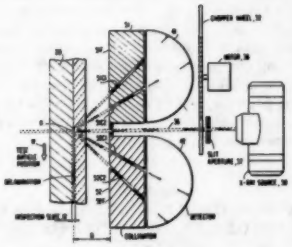
1. Apparatus useful in producing a tomographic image of a selected slice of an object to be examined, said apparatus comprising:

a source of penetrating radiation,

sweep means for forming energy from said source into a pencil beam and for repeatedly sweeping said pencil beam over a line in space to define a sweep plane,

means for supporting said object to be examined so that said pencil beam intersects said object along a path passing through said object and said selected slice,

line collimating means for filtering radiation scattered by said object, said line collimating means having a field of view which intersects said sweep plane in a bounded line so that said line collimating means passes only radiation scattered by elementary volumes of said object lying along said bounded line,



positioning means for repositioning said object so that a linear segment of said selected slice of said object is illuminated by said sweeping pencil beam from a plurality of different directions,

radiation detector means responsive to radiation passed by said line collimating means for generating at least a different signal sequence for each of said different directions of illumination of said linear segment of said selected slice of said object, and

processing means responsive to said signal sequences for producing a line image component of a tomographic image.

4,899,284

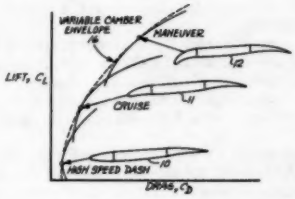
WING LIFT/DRAG OPTIMIZING SYSTEM

George E. Lewis, Renton; Robert E. Thomasson, Seattle, and David W. Nelson, Redmond, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 27, 1984, Ser. No. 656,131

Int. Cl.[4] G06G *7/70*

U.S. Cl. 364—435 **3 Claims**



1. For an aircraft that includes a wing having at least one leading edge surface and at least one trailing edge surface, wherein said surfaces are movable to vary said wings, camber, said aircraft being subject to variations in flight conditions that include changes in aircraft speed, altitude and normal acceleration, all of which are substantially caused by aircraft in-flight maneuvers, an apparatus for continuously optimizing the L/D ratio of said wing during said maneuvers, comprising:

means for continuously sensing actual values of aircraft, speed, aircraft normal acceleration, aircraft weight, and air dynamic pressure while said aircraft is in-flight,

an on-board computer, operatively connected to said sensing means for continuously receiving said sensed speed, acceleration, weight and dynamic pressure therefrom, said computer being operative to continuously calculate a coefficient of lift from said sensed acceleration, weight and dynamic pressure,

with said computer including a data memory bank having stored test data that indicates the desired optimum position for each of said surfaces for optimizing said wing's L/D ratio given certain values of coefficient of lift, aircraft speed, and dynamic pressure, wherein

said computer is operatively connected to said leading and trailing edge surfaces to move said surfaces, and wherein

said computer is further operative to continuously obtain from said data memory bank the optimum position of said surfaces by compairing said test data with said calculated coefficient of lift, said actual aircraft speed and said actual dynamic pressure, and to accordingly adjust said surfaces to said optimum position in a continuous manner during said maneuvers.

4,899,285

SYSTEM AND METHOD FOR MEASURING A POSITION OF A MOVING OBJECT WITH A HYBRID NAVIGATION APPARATUS

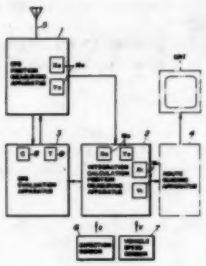
Okihiko Nakayama, Kamakura; Toshiyuki Itoh, and Katsuhiko Mizushima, both of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Jun. 25, 1987, Ser. No. 66,159

Claims priority, application Japan, Jun. 26, 1986, 61-148050

Int. Cl.[4] G06F *15/50*

U.S. Cl. 364—453 **14 Claims**



1. A hybrid system for deriving a position of a moving object, comprising:

(a) first means for receiving an electromagnetic wave from at least one satellite and a Global Positioning System for the measurement of an absolute position of the moving object and for deriving the position of the moving object on the basis of data from the received electromagnetic wave;

(b) second means, having a first sensor for detecting a movement direction of the moving object and a second sensor for detecting a movement speed of the moving object, for calculating a product of the detected movement direction and movement speed of the moving object and integrating the product with respect to time so as to derive a movement distance of the moving object and direction thereof with respect to a reference position and for calculating a sum of

(i) the derived movement distance, and

(ii) direction and the reference position so as to derive a current position of the moving object;

(c) third means for comparing at least two successively derived positions of the first means with the derived current position of the second means so as to evaluate a reliability of the at least two derived positions of the first means; and

(d) fourth means for setting a latter one of said at least two derived positions of the third means as the reference position when the third means evaluates that the two derived positions of the first means are reliable.

4,899,286

PROCESS FOR DETERMINING THE OPTIMUM WINDING SPEED, AS WELL AS THE OPTIMUM WINDING PARAMETERS FOR EACH TYPE OF YARN

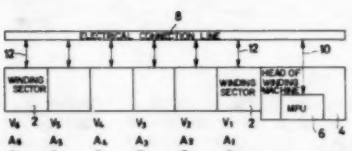
Luigi Colli; Roberto Badiali, and Nereo Marangone, all of Pordenone, Italy, assignors to Savio, S.p.A., Pordenone, Italy

Filed Dec. 16, 1987, Ser. No. 133,311

Claims priority, application Italy, Dec. 23, 1986, 22809

Int. Cl.[4] G06F *15/46*; D01H *13/26*; B65H *54/02*

U.S. Cl. 364—470 **3 Claims**



1. A process of determining the optimum values of operating parameters of an automatic coner machine, comprising:

(a) subdividing the winding front of the automatic coner machine into various winding sectors wherein each of said sectors includes at least one winding unit;

(b) presetting the values of operating parameters for the speed, acceleration, and braking different from winding sector to winding sector by means of a central microprocessor unit;

(c) presetting the same value of the remaining processing parameters for all of said winding sectors; and

(d) receiving and comparing the data from each of said winding sectors with each other by said central microprocessor unit for defining and displaying said speed, acceleration, and braking values for achieving high yarn winding productivity.

4,899,287

PROCESSOR FOR SEWING MACHINES

Hartmut Hülsboff, Bad Wimpfen; Peter Kothe, Darmstadt-Eberstadt; Michael Luft, Darmstadt, and Ulrich Schiltz, Darmstadt-Arheiligen, all of Fed. Rep. of Germany, assignors to Quick-Rotan Elektromotoren GmbH, Darmstadt, Fed. Rep. of Germany

Continuation of Ser. No. 887,111, Sep. 9, 1986, abandoned. This application Feb. 29, 1988, Ser. No. 162,245

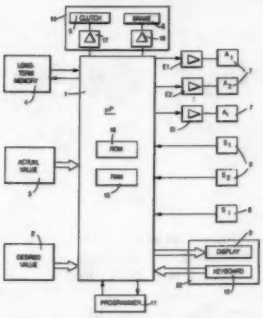
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1984, 3441485

Int. Cl.[4] G06F *15/46*; D05B *19/00*

U.S. Cl. 364—470 **24 Claims**

1. Sewing processor arrangement for operational control of at least one sewing device, including auxiliary units, and for rotational speed control of a positioning drive which drives the at least one sewing device, comprising long term memory means for storing operational control characteristics and rotational speed control characteristics, digital programming means for writing into and retrieving from said long term memory means all parameters necessary for at least one sewing operation and for the rotational speed control of the position drive, said parameters including sewing machine parameter data as well as operating data, wherein the operating control

and rotational speed control characteristics can be stored in said long term memory means and modified by the digital programming means during operation, said sewing processor arrangement further including an interface through which the parameters can be written into and read out from the long term memory means by said digital programming means, and a



sewing machine plug or adaptor for recognizing a connected sewing device by a code word before beginning a sewing operation by sensor lines and, in case of incompatibility, for transmission of an error code for avoiding erroneous functions and preventing a start of the entire sewing operation or a specific sewing operation.

4,899,288

TEMPERATURE CONTROL INDICATING APPARATUS OF A HOT RUNNER IN A THERMOPLASTIC SYNTHETIC RESIN INJECTION MOLDING SYSTEM

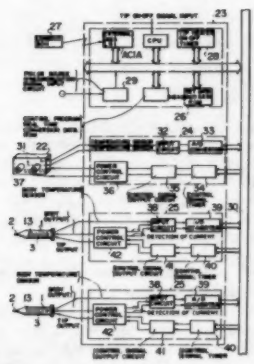
Shigeru Tsutsumi, 1165 Touyama-Machi, Yonezawa-shi-Yamagata-ken, Japan

Continuation of Ser. No. 5,247, Mar. 27, 1987, abandoned, which is a continuation-in-part of Ser. No. 914,132, Nov. 1, 1986, abandoned, which is a continuation of Ser. No. 803,418, Dec. 2, 1985, abandoned. This application May 12, 1988, Ser. No. 193,403

Claims priority, application Japan, Dec. 5, 1984, 59-255687

Int. Cl.[4] B29F *1/00*; G06F *15/00*

U.S. Cl. 364—476 **4 Claims**



1. A temperature control indicating apparatus for a hot runner in a thermoplastic synthetic resin injection molding system, which comprises:

a central processor including digital controller including a microprocessor;

a bi-directional communication channel connected to said central processor;

hot runners, each hot runner including a body heater remotely positioned from said central processor; and

a hot runner temperature controller having A/D converter connected to each hot runner and said bi-directional communication channel for controlling current to said body heater of each hot runner.

4,899,289

APPARATUS FOR AND METHOD OF PROCESSING SIGNALS IN A COMPOSITE WAVEFORM INCLUDING NOISE AND A PERIODIC COMPONENT

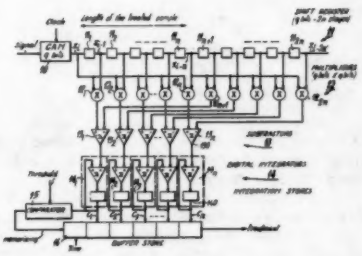
Jean Appel, Vanves, France, assignor to Office National d'Etudes et de Recherche Aerospatiales, Chatillon, France

Filed Oct. 30, 1987, Ser. No. 114,748

Claims priority, application France, Oct. 31, 1986, 86 15250

Int. Cl.[4] G06G *7/19*; G01R *23/02*

U.S. Cl. 364—484 **3 Claims**



1. Apparatus for detecting the occurrence of a periodic signal embedded in noise, including real time means for calculating the autocorrelation functions of the signal and deducing the frequency of the signal from the value of the autocorrelation function coefficients, said apparatus comprising:

an analog to digital converter for periodically transforming samples of the signal into digital signals, each of the digital signals having at least one bit,

means for delaying each of said digital signals by a predetermined time interval Δt and multiples thereof, said delaying means including a first delay circuit group of n delay circuits for delaying said digital signals by Δt, $2\Delta t$ $n\Delta t$ and a second delay circuit group of n delay circuits for delaying said digital signals by $(n+1)\Delta t$, $(n+2)\Delta t$, . . . , $2n\Delta t$;

multiplying means including a first multiplying circuit group of n multiplying circuits for multiplying the digital signals derived by said converter by digital output signals of the first delay circuit group and a second multiplying circuit group of n multiplying circuits for multiplying digital signals derived by the last delaying circuit of the first delay circuit group by digital signals derived by the second delay circuit group;

subtractor means for respectively subtracting digital signals representing products derived by the second multiplying circuit group from digital signals representing products derived by the first multiplying circuit group;

integrator means for integrating digital signals representing differences derived by said subtractor means, the signals derived by said integrator means being the coefficients of the autocorrelation function of the input signal;

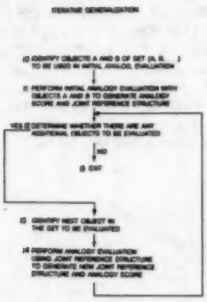
means for selecting at least one of said coefficients; and

comparator means for comparing the selected coefficient with a predetermined threshold, said comparator means deriving an output signal in response to the input signal containing a periodic component.

4,899,290
SYSTEM FOR SPECIFYING AND EXECUTING PROTOCOLS FOR USING ITERATIVE ANALOGY AND COMPARATIVE INDUCTION IN A MODEL-BASED COMPUTATION SYSTEM

David J. Hartzband, Nashua, N.H., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Oct. 16, 1987, Ser. No. 109,555
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—513 **49 Claims**



1. A system for iteratively performing logical evaluation operations in connection with a set of objects, each having an associated reference structure, comprising:

A. initial evaluation means for performing a logical evaluation operation in connection with a predetermined pair of objects from said set to generate an evaluation reference structure identifying selected relationships between the reference structures of said predetermined pair of objects; and

B. iterative evaluation means for iteratively performing a logical evaluation operation in connection with the reference structure of each of the objects in said set and a previously generated reference structure to produce a reference structure to be used during a succeeding iteration and a score identifying a similarity relationship between the object's reference structure and a reference structure generated during a previous iteration.

4,899,291
IMAGE PROCESSING SYSTEM

Masaharu Tsukada, Kasasaki; Shigeru Aoi, and Takaaki Ashinuma, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 733,768, May 14, 1985, abandoned.
This application Aug. 4, 1987, Ser. No. 81,445
Claims priority, application Japan, May 22, 1984, 59-103116; May 22, 1984, 59-103117; May 22, 1984, 59-103118
Int. Cl.[4] H04N *1/21, 1/23*
U.S. Cl. 364—518 **32 Claims**

1. An image processing system comprising:

a memory medium capable of storing image information representative of a plurality of images;

designating means for designating desired image information to be read out from said memory medium and which corresponds to a plurality of pages;

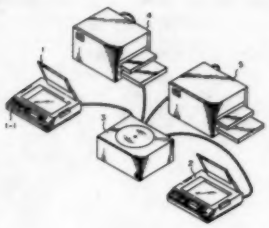
readout means for reading, in order, image information designated by said designating means, from said memory medium;

image forming means for forming the image information from said readout means;

interface means for synchronizing said readout means with said image forming means, wherein said interface means comprises a plurality of line buffer memories for storing the image information read by said readout means;

generating means for generating an indicating signal which indicates that the image information stored in said plurality of line buffer memories should be output to said image forming means; and

control means for controlling said interface means such that

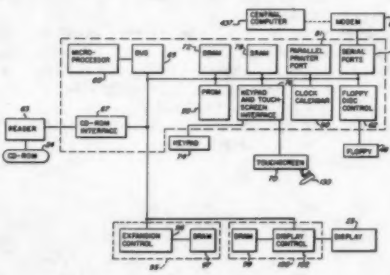


the image information stored in said plurality of line buffer memories is output to said image forming means before the image information designated by said designating means, corresponding to each of said plurality of pages, has been completely read out by said readout means.

4,899,292
SYSTEM FOR STORING AND RETRIEVING TEXT AND ASSOCIATED GRAPHICS

John A. Montagna, Trenton; Gary Irving, Skillman; Lee Farrell, Lawrenceville, all of N.J.; Gerald Cross, Philadelphia, and Stephen A. Miller, Upper Black Eddy, both of Pa., assignors to Image Storage/Retrieval Systems, Inc., Langhorne, Pa.

Filed Mar. 2, 1988, Ser. No. 163,398
Int. Cl.[4] G06F *3/03*
U.S. Cl. 364—521 **18 Claims**



15. A process for storing and displaying documents including graphic images, said process comprising the steps of:

storing a multiplicity of documents in digital form;

storing a multiplicity of graphic images in compressed, digital form, a first plurality of said graphic images being associated with a first one of said documents;

selecting said first document for processing from said multiplicity of documents;

decompressing said first plurality of graphic images after said first document is selected;

displaying first selection information corresponding to a first decompressed graphic image in said first plurality and second selection information corresponding to a second decompressed graphic image in said first plurality;

selecting said first decompressed graphic image for display by touching a region of a touch screen overlaying said first selection information;

displaying said first decompressed graphic image without displaying said second decompressed graphic image;

selecting said second decompressed graphic image for dis-

play by touching a second region of said touch screen overlaying said second selection information;

displaying said second selected decompressed graphic image after displaying said first decompressed graphic image;

displaying third selection information representing a command to scroll the display of said first document;

touching a third region of said touch screen corresponding to said third selection information; and

scrolling said first document in response to the touching of said third region of said touch screen.

4,899,293

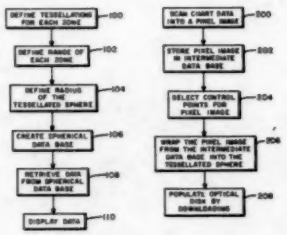
METHOD OF STORAGE AND RETRIEVAL OF DIGITAL MAP DATA BASED UPON A TESSELLATED GEOID SYSTEM

John F. Dawson, and Edward W. Ronish, both of Albuquerque, N. Mex., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 24, 1988, Ser. No. 261,109

Int. Cl.[4] G06F *15/50*

U.S. Cl. 364—521 **5 Claims**



5. A method for the storage and retrieval of aeronautical chart data onto an optical disk image comprising the steps of:

(a) scanning the chart data into a pixel image;

(b) storing the pixel image into an intermediate data base;

(c) selecting control points for the pixel image;

(d) warping the pixel image from the intermediate data base into a spherical data base representative of a tessellated sphere having five zones wherein the tessellations for the zones are defined so as to cause an overlap of two rows where adjacent rows meet, and wherein the zone boundary is defined at the middle of the overlap; and

(e) populating the optical disk image by down sampling the pixel image from the spherical data base.

4,899,294

GRAPHICS PROCESSING SYSTEM

Colin J. Easton, Romsey, and Adrian C. Gay, Fareham, both of United Kingdom, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 18, 1987, Ser. No. 121,976

Claims priority, application United Kingdom, Nov. 18, 1986, 8627552

Int. Cl.[4] G06F *15/72*

U.S. Cl. 364—522 **14 Claims**

1. A graphics processing system of the type comprising:

a source of image data defining the boundary of an area forming at least part of an image to be displayed on a display having a plurality of display lines;

image storage defining a map of said image in terms of the individual picture elements for each of plural display lines; and

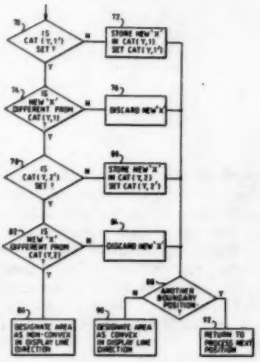
means for generating an image map from said image data, wherein said generating means comprises:

means for defining a plurality of paired storage locations in said image storage, each of said pairs of locations being associated with a corresponding one of said plural display lines and each of said storage locations being capable of being occupied by a computed displacement value of a sequential boundary point;

processing means for initially processing said image data by computing the displacements along each display line at which sequential boundary points are to be displayed and producing respective displacement values in accordance therewith;

means for detecting whether said storage locations are occupied by displacement values and storing the computed displacement values of the points, as they are computed, in storage locations for their respective display lines, that are not already occupied by displacement values;

means for determining if said area is non-convex in the displacement direction of the display lines by determining whether both storage locations of a given display line are occupied by displacement values different from the displacement value just computed therefor by said porcessing means and for producing a first indication, in response to a positive determination, indicating that said area is nonconvex;



means for determining if the complete boundary of said area has been processed and at most two different displacement values per display line have been detected and stored in the appropriate storage locations, and for providing a second indication, in response to a positive determination, indicating said area is at least one dimensionally convex in the displacement direction of the display lines; and

control means for reactuating said processing means to continue the processing of said image data in either a first or a second further processing mode, respectively in response to said first or second indications, to generate an image map from said image data.

4,899,295

VIDEO SIGNAL PROCESSING

Brian R. G. Nonweiler, Berkshire, Great Britain, assignor to Quantel Limited, Kenley, Great Britain

Filed May 20, 1987, Ser. No. 52,464

Claims priority, application United Kingdom, Jun. 3, 1986, 8613447

Int. Cl.[4] G06F *15/72*

U.S. Cl. 364—522 **8 Claims**

1. A video signal processing system for changing the shape of a video image so that a video frame appears to take the form of a three-dimensional object, comprising:

(a) an address storage device for storing an address map defining the shape of said three-dimensional object;

(b) a frame store;

(c) means for loading pixels of an input frame into the frame store in a first sequence;

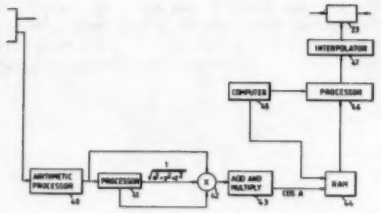
(d) means for reading said pixels out of said frame store in a

second sequence, wherein the relationship between said first sequence and said second sequence is determined from the address map;

(e) a processing device for processing the address data in combination with an indication of the position of an imaginary light source to produce light intensity factors; and

(f) means for adjusting the value of each pixel in the video frame in response to a light intensity factor to produce a video frame having shading due to the imaginary light source;

in which:



said processing device includes means for calculating the angle between a vector which is perpendicular to a surface of the three dimensional object and a vector from said surface to said light source, and means for producing a light intensity factor related to said angle; and

said address map representing the three dimensional object consists of a plurality of point coordinates, and the processing device includes means for calculating a light intensity factor for each surface defined by three adjacent coordinates.

4,899,296

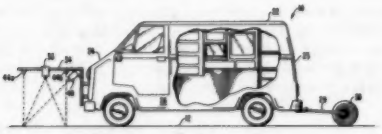
PAVEMENT DISTRESS SURVEY SYSTEM

Anwar S. Khattak, 612 S. Lincoln, Spokane, Wash. 99204

Continuation-in-part of Ser. No. 195,321, May 18, 1988, abandoned, Ser. No. 120,066, Nov. 13, 1987, Pat. No. 4,788,859, Ser. No. 144,986, Jan. 19, 1988, abandoned, and Ser. No. 150,955, Feb. 1, 1988. This application Aug. 8, 1988, Ser. No. 229,655

Int. Cl.[4] G01B *11/30*

U.S. Cl. 364—550 **9 Claims**



1. A pavement distress survey system comprising:

a surface vehicle means for moving over a length of a pavement being inspected;

a first video camera means for optically inspecting said pavement for surface defects, wherein said first video camera means is mounted on said surface vehicle means and is projected towards said pavement, and wherein said first video camera means moves over a surface of said pavement as said surface vehicle means is moved over said length of said pavement;

a second video camera means for optically inspecting said pavement for surface defects, wherein said second video camera means is mounted on said surface vehicle means spaced apart from said first video camera means and is projected onto said pavement surface at a generally acute angle relative to said first video camera means for having a second field of view which has at least a portion thereof in common with said first video camera means; and

a video signal processing means for determining a surface condition of said length of said pavement travelled by said surface vehicle means, wherein said video signal processing means is operatively connected to said first and second video camera means,

wherein said first and second video camera means comprise infrared video camera means for capturing the pavement surface temperature profile from said surface vehicle means.

4,899,297

METHOD AND APPARATUS FOR AUTOMATICALLY TESTING TEMPERATURE MEASURING DEVICES

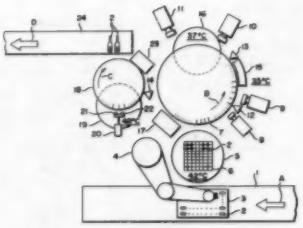
Yoshikazu Sano; Susumu Kobayashi, and Kiyoshi Endo, all of Fujinomiya, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 4, 1988, Ser. No. 177,492

Claims priority, application Japan, Apr. 8, 1987, 62-84526

Int. Cl.[4] G06F *15/20*

U.S. Cl. 364—557 **7 Claims**



1. A method of automatically testing a temperature measuring device having a plurality of functions to be tested, the temperature measuring device including a temperature responsive element, the method comprising the steps of:

heating at least the temperature responsive element of the temperature measuring device until thermal equilibrium of a predetermined temperature is attained;

testing a thermal equilibrium temperature measurement function of said temperature measuring device by reading display information from said temperature measuring device after said heating step and comparing this display information with information indicative of the predetermined temperature;

cutting off power to said temperature measuring device after said testing step and then reintroducing power to said temperature measuring device; and

testing an initial display function of said temperature measuring device by reading the display information from said temperature measuring device after the reintroduction of power and comparing this display information with predetermined information.

4,899,298

HIGH RESOLUTION MEASUREMENT OF MOVING MATERIALS USING A SCINTILLATION DETECTOR

Mario W. Overhoff, c/o Overhoff Technology Corporation, 1160 U.S. Route 50, Milford, Ohio 45150

Filed Feb. 25, 1988, Ser. No. 160,369

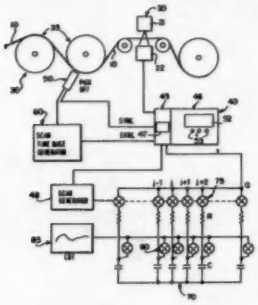
Int. Cl.[4] G06F *15/46*; G01B *15/02*

U.S. Cl. 364—558 **12 Claims**

1. A method of using a scintillation detector to measure the areal density of an article wherein there are periodic repetitions of the areal density, the method comprising the steps of causing relative movement between said detector and the article,

measuring the areal density by the scintillation detector at regular intervals, which intervals define a measurement increment,

repeating the measurements within each measurement increment at the same relative position within the periodic repetition, and



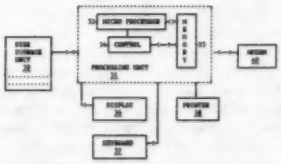
averaging the measurements taken within each increment over a plurality of periodic repetition intervals to obtain an accurate measurement of the areal density of the article.

4,899,299

METHOD FOR MANAGING THE RETENTION OF ELECTRONIC DOCUMENTS IN AN INTERACTIVE INFORMATION HANDLING SYSTEM

Margaret G. MacPhail, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1987, Ser. No. 138,231
Int. Cl.[4] G60K *15/00*
U.S. Cl. 364—570 **10 Claims**



1. A method for automatically controlling the retention and deletion of a plurality of electronic documents of different types stored in an interactive information handling system by a plurality of end users, each said stored document being assigned to either one of said end users or an administrator of said system to insure that said documents are retained in said system until the latest of two independently established expiration dates, said method comprising the steps of,

(A) storing in said system in association with each said document, first and second expiration dates which have been selected respectively in accordance with first and second different criteria, said first and second criteria reflecting future retention needs for said type of document respectively of said one of said end users and said administrator,

(B) periodically logically comparing with said system each said expiration date with a current date to determine if a predetermined relationship exists among said dates for each of said plurality of documents, and

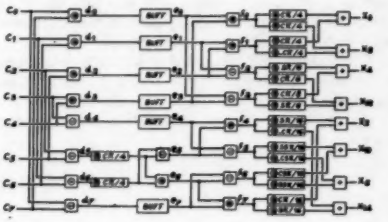
(C) deleting said associated document only when said step of comparing indicates that said current date is later than both of said expiration dates.

4,899,300

CIRCUIT TO PERFORM A LINEAR TRANSFORMATION ON A DIGITAL SIGNAL

Francis Jutand, 167 rue Etienne Dolet, 94230 Cachan; Nicolas Demassieux, 4 Impasse Reille, 75014 Paris, and Michel Dana, 53 rue de la Colonie, 75013 Paris, all of France

Continuation of Ser. No. 33,793, Apr. 3, 1987, abandoned. This application Mar. 30, 1989, Ser. No. 331,012
Claims priority, application France, Apr. 4, 1986, 86 04845
Int. Cl.[4] G06F *15/332*
U.S. Cl. 364—725 **3 Claims**



1. A circuit for performing a linear transformation on a digital signal composed of N samples, wherein N is an integer, said circuit comprising:

a first plurality of successive operator stages wherein each of said stages performs addition and subtraction operations by means of associated adders according to a determined linear transformation graph,

a second plurality of operator stages which perform multiplication operations by means of associated multipliers according to said graph, each stage of multiplication being between two stages of addition/subtraction;

buffers between two successive stages of addition/subtraction;

said graph including a third plurality of stages equal in number to said first plurality of successive stages of said circuit and wherein said graph further includes a plurality of branches wherein each branch represents an operation of multiplication by one of said associated multipliers between a variable operand and a determined coefficient and wherein said graph further comprises a plurality of nodes with each node representing an operation of addition or subtrraction by one of said associated adders between two variable operands,

the multiplier associated with each one of said branches being wired according to the value of said determined coefficient associated with said branch,

the adder for each of said plurality of nodes being wired according to one of the addition operation and the subtraction operation associated with said node.

4,899,301

SIGNAL PROCESSOR FOR RAPIDLY CALCULATING A PREDETERMINED CALCULATION A PLURALITY OF TIMES TO TYPICALLY CARRYING OUT FFT OR INVERSE FFT

Takao Nishitani; Yuichi Kawakami; Hideo Tanaka, and Ichiro Kuroda, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jan. 29, 1987, Ser. No. 8,684
Claims priority, application Japan, Jan. 30, 1986, 61-16697
Int. Cl.[4] G06F *7/34, 15/35*
U.S. Cl. 364—726 **5 Claims**

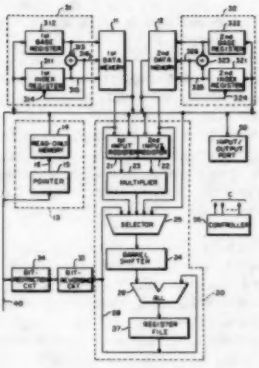
1. A signal processor for processing zero-th through (N−1)-th input elements of an input data signal into zero-th through (N−1)-th output elements of an output data signal, where N represents a predetermined positive integer, said signal processor comprising a memory unit having a plurality of addresses,

memory accessing means for accessing said memory unit to initially store said input elements in the respective memory addresses as stored elements, respectively, coefficient producing means for producing predetermined coefficients, and calculation performing means for performing a predetermined calculation a plurality of times on the stored elements read from said memory means by using said coefficients to generate said output elements as a function of said input elements and said coefficients, each of said stored elements being divided into a real part and an imaginary part, said memory unit comprising a first data memory having said plurality of memory addresses for storing the real parts of said stored elements and a second data memory having said plurality of memory addresses for storing the imaginary parts of said stored elements, said memory accessing means comprising:

a first address circuit coupled to said first data memory for calculating a first address to access the first data memory;

a second address circuit coupled to said second data memory for calculating the first address to access the second data memory;

a first register in cooperation with said first address circuit for indicating an address distance from said first address among said first data memory;



a second register in cooperation with said second address circuit for indicating the address distance from said first address among said second data memory;

a first adder coupled to said first address circuit and said first register for adding the address distance to the first address to supply said first data memory with a second address;

a second adder coupled to said second address circuit and said second register for adding the address distance to the first address to supply said second data memory with the second address;

reading means for reading a pair of stored elements from said first and said second addresses as a pair of read elements;

storing means for storing a pair of calculated elements in said first and said second addresses, said calculated elements being obtained by once performing said predetermined calculation on said pair of read elements;

a first line coupled to said first adder and said first address circuit for delivering said second address to said first address circuit; and

a second line coupled to said second adder and said second address circuit for delivering said second address to said second address circuit.

4,899,302

ARITHMETIC UNIT FOR INVERSE TRIGONOMETRIC FUNCTION

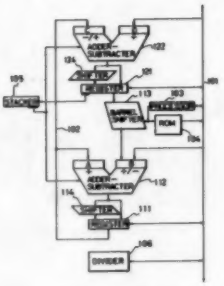
Misayo Nakayama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 15, 1989, Ser. No. 311,168

Claims priority, application Japan, Feb. 17, 1988, 63-35901

Int. Cl.[4] G06F *15/347*

U.S. Cl. 364—729 **5 Claims**



1. An arithmetic unit for carrying out sequentially arithmetic pseudo division and reverse-sequentially arithmetic pseudo multiplication according to algorithm based on CORDIC method utilizing constant values $(2^k)\arctan(2^{-k})$ so as to calculate value of inverse trigonometric function arctan Y/X, the unit comprising: generating means for sequentially generating the constant values $(2^k)\arctan(2^{-k})$ from k=m−1 to k=0 where k=0, 1, . . . , m−1; a first register operable during the pseudo division for storing a first variable and operable during the pseudo multiplication for storing a destined variable; a second register operable during the pseudo division for storing a second variable; a barrel shifter for right-shifting the value of second variable by a given shift bit count 2_k where k=1, 2, . . . , m−2, m−1, m; a first adder-subtracter operative during the pseudo division for selectively adding or subtracting the right-shifted value of second variable to or from the value of first variable to output the result into the first register to thereby update the value of first variable, and operative during the pseudo multiplication for selectively adding or subtracting the constant value of generating means to or from the value of destined variable stored in the first register to output the result into the first register to thereby update the value of destined variable; a second adder-subtracter operative during the pseudo division for selectively adding or subtracting the value of first variable to or from the value of second variable to output the result into the second register to thereby update the value of second variable; and m-stage stack means operative to process a sign bit of the second variable in First-In, Last-Out basis for controlling the first and second adder-subtracters to selectively carry out adding or subtracting operation.

4,899,303

FAULT DETECTION SYSTEM FOR AN ARITHMETIC UNIT

Masayuki Kimura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 25, 1988, Ser. No. 173,163

Claims priority, application Japan, Mar. 27, 1987, 62-75653

Int. Cl.[4] G06F *11/10*

U.S. Cl. 364—739 **6 Claims**

1. A fault detection system for an arithmetic unit, said fault detection system comprising:

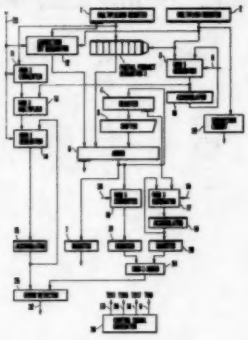
a shift-and-add multiplier capable of both a normal multiplication and a division for calculating a quotient as a product of a dividend and a reciprocal of a divisor;

modulo 3 emulator means for emulating said multiplier in modulo 3 arithmetic;

conversion means for converting a multiplication result of said multiplier into a modulo 3 equivalent;

comparison means for comparing outputs from said conversion means and said modulo 3 emulator means to detect a bit error; and

control means for supplying, to said modulo 3 emulator means and to said conversion means, a control signal



representing at least one of a normal multiplication mode of said multiplier, a multiplication mode for calculating a product of a divisor and a reciprocal of said divisor, a multiplication mode for calculating a product of a dividend and a reciprocal of a divisor, and a multiplication mode for calculating a partial quotient in a division process, and for controlling generation of module 3 equivalents in said modulo 3 emulator means and said conversion means.

4,899,304

OVERFLOW DETECTION CIRCUIT

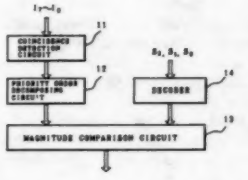
Hideyuki Terane, and Kazuya Ishihara, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jun. 2, 1988, Ser. No. 202,159

Claims priority, application Japan, Jan. 12, 1988, 63-5295

Int. Cl.[4] G06F *11/00*

U.S. Cl. 364—745 **1 Claim**



1. An overflow detection circuit for a shifter comprising:

a coincidence detection circuit for detecting coincidence and non-coincidence between the most significant bit of data to be shifted and another bit besides the most significant bit so as to output binary bit string signals respectively corresponding to the coincidence and non-coincidence;

a priority order decomposing circuit which receives the above mentioned bit string signals;

a decoder for decoding signals representing a shift value used in shifting the aforementioned data; and

a magnitude comparison circuit for comparing the magnitude of the outputs of the aforementioned priority order decomposing circuit and the decoder so as to output binary signals according to the compared magnitude, wherein the output of said magnitude comparison circuit is employed as an overflow detection signals.

4,899,305

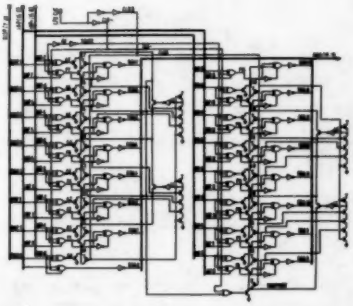
MANCHESTER CARRY ADDER CIRCUIT

William M. Needles, Arlington, Tex., assignor to National Semiconductor Corp., Santa Clara, Calif.

Filed Jun. 15, 1988, Ser. No. 207,322

Int. Cl.[4] G06F *7/50*

U.S. Cl. 364—787 **6 Claims**



1. A Manchester carry adder circuit of the type that includes a plurality of series-connected elemental adder circuits for performing addition of bit position $n+1$ of N-bit terms A and B by adding the operands $An+1$ and B_{n+1} and the carry C_n from the previous bit position n to produce a sum digit and a possible carry-out digit C_{n+1} for carry to the subsequent bit position $n+2$, the circuit comprising

(a) a first x bit adder that uses a static technique to perform addition of the least significant bit of the terms A and B and a dynamic technique to perform addition on the remaining $x-1$ bits;

(b) a second N-x bit adder that uses a static technique to perform addition on the most significant bit of the terms A and B and a dynamic technique to perform addition on the remaining $N-x-1$ bits; and

(c) means for combining the first and second adders at the most significant bit of the first adder and the least significant bit of the second adder using the carry-out C_x of the first adder and the carry-in of the least significant bit position of the second adder.

4,899,306

TEST INTERFACE CIRCUIT WHICH GENERATES DIFFERENT INTERFACE CONTROL SIGNALS FOR DIFFERENT TARGET COMPUTERS RESPONDING TO CONTROL SIGNALS FROM HOST COMPUTER

Steven C. Greer, Lisle, Ill., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 26, 1985, Ser. No. 769,138

Int. Cl.[4] G06F *15/20, 9/06*

U.S. Cl. 364—900 **6 Claims**

1. An adaptable test interface for use with a host computer and a plurality of target computers of different types having differing input/output characteristics comprising:

memory means;

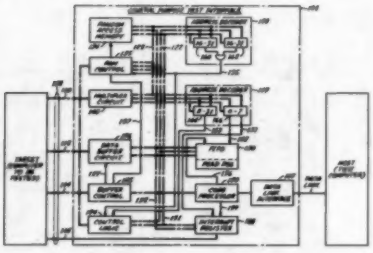
first control means, connected to said memory means, responsive to control signals from said host computer to write test data received from said host computer into and read target output data from said memory means and to

generate a unique set of interpretation control signals for each computer type to be tested;

interconnecting means for connecting said first control means to said host computer;

second control means, connected to said first control means, responsive to said interpretation controll signals and control signals from a target computer to be tested for generating interface control signals; and

address decoder means, connected to said second control means, responsive to said interface control signals and address signals from said target computer to generate memory control signals;



said memory means, connected to said address decoder means, responsive to said memory control signals to access memory locations defined by said address signals from said target computer and selectively transmit said test data to and store said target output data from said target computer;

whereby a target computer obtains from the memory means test data supplied by the host computer and returns target output data to the memory means for examination by the host computer.

4,899,307

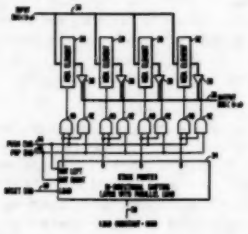
STACK WITH UNARY ENCODED STACK POINTER

Daniel E. Lenoski, Mountain View, Calif., assignor to Tandem Computers Incorporated, Cupertino, Calif.

Filed Apr. 10, 1987, Ser. No. 36,607

Int. Cl.[4] G11C *13/00*

U.S. Cl. 365—78 **7 Claims**



1. A memory stack comprising:

a plurality of multi-bit storage elements for storing data in fixed positions as a stack;

I/O bus means coupled to each of said storage elements;

a plurality of control means for enabling the input and output of data, each being coupled between said I/O bus means and a single one of said storage elements; and

an unary encoded stack pointer consisting of a serial, bidirectional shift register having a plurality of single bit outputs, each single bit output being coupled to a single one of said control means, such that a value having a single active bit can be shifted in said shift register to point to a one of said storage elements which is a top of said stack.

4,899,308

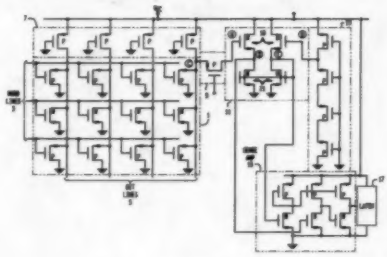
HIGH DENSITY ROM IN A CMOS GATE ARRAY

Emdadur R. Khan, San Jose, Calif., assignor to Fairchild Semiconductor Corporation, Santa Clara, Calif.

Filed Dec. 11, 1986, Ser. No. 940,363

Int. Cl.[4] G11C *11/40*; H03K *19/094*

U.S. Cl. 365—104 **13 Claims**



1. A memory device for storing information, comprising:

a matrix of CMOS FETs for storing information, wherein each FET has a drain, a gate and a source, the gates of the FETs in each row of the matrix are connected to one of a plurality of word-lines, the drains of N-channel FETs in each column of the matrix are connected to one of a plurality of bit-lines, the sources of P-channel FETs in each column of the matrix are also connected to one of the plurality of bit-lines, and the stored information is read by sensing voltage levels on the bit-lines;

a plurality of load transistors which connect respective bit lines of said memory device to a power supply voltage source;

a level-shifting circuit having a first input which is coupled to one of the plurality of bit-lines to produce an output that is indicative of the voltage level on that bit line and is shifted in a direction away from the voltage of said voltage source;

a reference voltage circuit for providing a reference level for a bit-line voltage which compensates for power supply fluctuations and variations in manufacture of the device, said reference voltage circuit comprising a series-connection of a predetermined number of FETs and having an output connected to a second input of said level-shifting circuit;

a sense amplifier connected to the output of said level shifting circuit for detecting the bit-line voltage levels; and

a latch circuit for holding an output voltage from the sense amplifier.

4,899,309

CURRENT SENSE CIRCUIT FOR A ROM SYSTEM

Shooji Kitazawa; Hiroshi Kuwabara, and Teruhiro Harada, all of Tokyo, Japan, assignors to Oki Electric Co., Ltd., Tokyo, Japan

Filed Jul. 28, 1988, Ser. No. 225,374

Claims priority, application Japan, Aug. 3, 1987, 62-194257

Int. Cl.[4] G11C *7/00, 11/40*; H03F *3/45*

U.S. Cl. 365—189.01 **8 Claims**

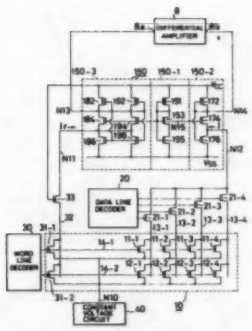
1. A current sense circuit for detecting a read current from a selected memory cell in a memory cell matrix of a ROM, comprising:

a first series circuit and a second series circuit, each comprising:

a current supply means having a first main electrode connected to a power supply and a second main electrode;

a first MOS FET having a first main electrode connected to the second main electrode of said current supply means, a second main electrode and a gate electrode; and

a second MOS FET having a first main electrode connected to the second main electrode of said first MOS FET, a second main electrode connected to a second power supply, and gate electrode connected to the first main electrode of said first MOS FET;



wherein the gate electrode of said first and said second MOS FETs of said reference voltage generator are connected together;

the gate electrodes of said first MOS FETs of said first and second series circuits are connected together; and

the ratio of the current driving capability between said first MOS FET of said first series circuit and said first MOS FET of said second series circuit is substantially equal to the ratio of the current driving capability between said second MOS FET of said first series circuit and said second MOS FET of said second series circuit.

4,899,310

SEMICONDUCTOR MEMORY DEVICE HAVING A REGISTER

Fumio Baba, Kawasaki; Kazuya Kobayashi, Itabashi; Seiji Enomoto, Seto, and Hiroaki Ogawa, Nagoya, all of Japan, assignors to Fujitsu Limited, Kawasaki and Fujitsu VLSI Limited, Kasugai, both of, Japan

Filed Jun. 22, 1988, Ser. No. 209,819

Claims priority, application Japan, Jun. 25, 1987, 62-158575

Int. Cl.[4] G11C *11/40, 13/00*

U.S. Cl. 365—189.05 **17 Claims**

1. A semiconductor memory device having a register comprising:

a memory cell array having memory cells;

a data bus;

input/output means provided between the memory cell array and the corresponding data bus;

register means for storing predetermined data;

transfer gate means being connected between the data bus and the register means;

first data buffer means for transferring data on the data bus to an external circuit;

second data buffer means for transferring data derived from the external circuit to the data bus; and

controlling means for disconnecting the input/output means from the data bus and turning OFF the transfer gate means in a first operation mode and for connecting the input/output means to the data bus and turning ON the transfer gate means in a second operation mode,

wherein in the first operation mode, one of a data read operation and write operation is performed between the memory cell array and the external circuit via the data bus and either one of the first and second buffer means, and alternatively in the second operation mode one of the data read operation and write operation is performed between the register means and the external circuit via the transfer gate means, the data bus and either one of the first and second buffer means.

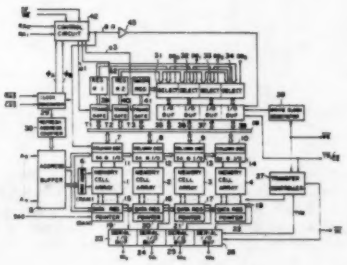
9. A semiconductor memory device having a register comprising:

a plurality of memory cell arrays each having memory cells;

a plurality of data buses each provided for the respective memory cell arrays;

a plurality of input/output means each provided between the respective memory cell arrays and data buses;

register means connected to any one of the plurality of data buses for storing predetermined data;



transfer gate means being connected between the register means and the data bus to which the register means is connected;

a plurality of first data buffer means each provided for the respective memory cell arrays for transferring data on the respective buses to an external circuit;

a plurality of second data buffer means each provided for the respective memory cell arrays for transferring data derived from the external circuit to the respective data buses; and

controlling means for disconnecting the input/output means from the data bus to which the transfer gate means is connected and turning OFF the transfer gate means in a first operation mode and for connecting the input/output means to the data bus and turning ON the transfer gate means in a second operation mode,

wherein in the first operation mode, one of a data read operation and write operation is performed between the memory cell arrays and the external circuit, and alternatively in the second operation mode one of the data read operation and write operation is performed between the register means and the external circuit.

4,899,311

CLAMPING SENSE AMPLIFIER FOR BIPOLAR RAM

Richard J. Petschauer, Edina, and Robert J. Bergman, Roseville, both of Minn., assignors to Unisys Corporation, Blue Bell, Pa.

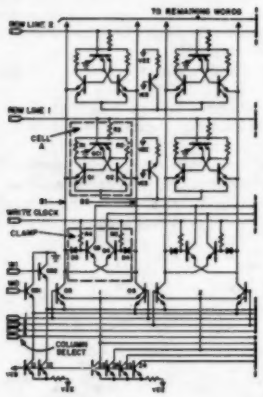
Filed Aug. 29, 1988, Ser. No. 237,470

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—189.06 **12 Claims**

1. In a bipolar random access memory comprising a plurality of memory cells, a plurality of select word lines and a plurality of pairs of select bit lines coupled to said memory cells, and an output driver, the improvement comprising first and second

clamping means, a plurality of sense amplifier means each comprising first and second bipolar transistor means each of which comprise a collector-emitter current path and a gate means for controlling current flow in its associated collector-emitter path, wherein both of said collector-emitter paths are coupled between said output driver and a different select bit line of the same pair of said plurality of pairs of said bit lines,



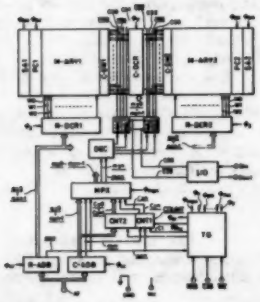
and said gate means of said bipolar transistor means has its collector-emitter path coupled to a first one of said select bit lines of said pair of bit lines through said first clamping means to the second one of said select bit lines of said pair of bit lines, and said gate means of said other bipolar transistor has its collector-emitter path coupled to said second one of said pair of said select bit lines through said second clamping means to said first one of said select bit lines.

4,899,312

SEMICONDUCTOR MEMORY

Katsuyuki Sato, Kodaira, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 820,326, Jan. 21, 1986, Pat. No. 4,758,995. This application Jul. 1, 1988, Ser. No. 214,542
Claims priority, application Japan, Jan. 23, 1985, 60-9046
Int. Cl.[4] G11C *8/00*
U.S. Cl. 365—230.09 **20 Claims**



1. A semiconductor memory comprising:

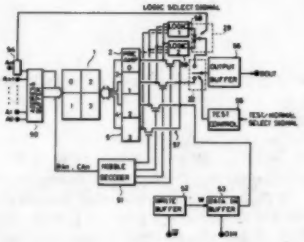
a plurality of memory cells; selecting means for selecting a plurality of memory cells in said plurality of memory cells in accordance with first internal address signals; an input means for inputting data to the selected memory cells; storing means for storing a plurality of data read out of the selected memory cells; an output means for outputting said stored data in said storing means sequentially in response to change in a second internal address signal; signal generating means for generating said first internal address signals which indicate a plurality of memory cells to next be selected during the time that said storing means stores the data read out of the selected memory; and during the time that said storing means store data read out of the selected memory cells, said selecting means select a next plurality of memory cells.

4,899,313

SEMICONDUCTOR MEMORY DEVICE WITH AN IMPROVED MULTI-BIT TEST MODE

Masaki Kumanoya; Hideshi Miyatake; Katsumi Dosaka, and Yasuhiro Konishi, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 6, 1988, Ser. No. 178,427
Claims priority, application Japan, Apr. 15, 1987, 62-93514
Int. Cl.[4] G11C *7/00, 8/00*
U.S. Cl. 365—201 **15 Claims**



1. A semiconductor memory device comprising a memory cell array constituted by a plurality of memory cell bits each of which storing information, and internal signal generation means which reads and outputs simulataneously the information stored in the plural bit memory cells from said memory cell array, provided with operation modes including: a normal mode, in which the information is read from said internal signal generation means based on an external address; and a test mode, in which the information from said internal signal generation means is received by plurel bit unit and a logic value corresponding to said received plural bit information is outputted, said device comprising:

logical operation means which receives plural bit memory cell information simulataneously from said internal signal generation means and carries out selectively at least two predetermined logical operations for outputting results from said at least two predetermined logical operations;

a first terminal for receiving a logical operation select signal;

first selection means for selectivity outputting one of the results of the at least two logical operations carried out by said logical operation means in response to said logical operation select signal;

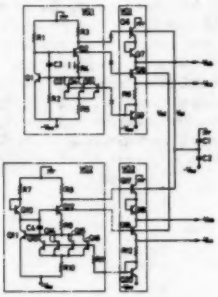
a second terminal for receiving a signal for selecting one of said test mode and said normal mode; and

second selection means which passes said first selection means output in said test mode and which passes the memory cell information from said internal signal generation means in said normal mode.

4,899,314
SEMICONDUCTOR MEMORY

Kazuhisa Miyamoto; Shuuichi Miyaoka, both of Ohme, and Masanori Odaka, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 21, 1988, Ser. No. 184,661
Claims priority, application Japan, Apr. 24, 1987, 62-99775
Int. Cl.[4] G11C *11/34*
U.S. Cl. 365—226 7 Claims

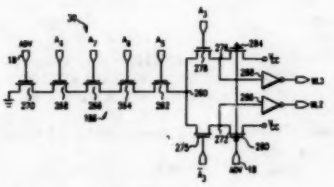


1. A semiconductor integrated circuit device comprising:
a first level generate means and a second level generate means for respectively generating different reference levels;
a first output means and a second output means linked to each other and each respectively supplied with one of the reference levels, wherein the first and second output means each respectively generate an output voltage corresponding to the reference level supplied thereto; and
selective link means for linking either one of said first and second level generate means to said first and second output means.

4,899,315
LOW-POWER, NOISE-RESISTANT READ-ONLY MEMORY

Theodore W. Houston, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 43,381, Apr. 28, 1987, Pat. No. 4,811,301. This application Nov. 14, 1988, Ser. No. 270,168
Int. Cl.[4] G11C *8/00*
U.S. Cl. 365—230.06 2 Claims

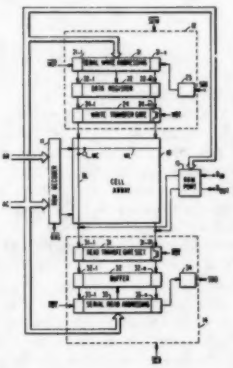


1. A memory including a plurality of rows and columns of memory cells, each row of memory being associated with a row address comprising a plurality of address bits, each row being capable of receiving a control signal through a word line, comprising:
a row decoder for decoding an address of one of said rows, said row decoder comprising a plurality of NAND circuits, each NAND circuit being capable of receiving input from signals including a selected set of signals corresponding to a selected set consisting of address bits, complements of address bits or a combination thereof, each NAND circuit being further capable of outputting a plurality of signals received by selected word lines;
each NAND circuit comprising a plurality of first transistors having current paths coupled in series between a voltage reference and a node, respective gates of said first transistors capable of receiving input from signals including a selected set of signals corresponding to a selected set consisting of address bits, complements of address bits or a combination thereof;
a second transistor capable of having a current path for coupling said node to a selected signal output from a selected NAND circuit; and
a third transistor having a current path for coupling said node to a signal selected from a set of signals corresponding to a selected set consisting of address bits, complements of address bits, or a combination thereof.

4,899,316
SEMICONDUCTOR MEMORY DEVICE HAVING SERIAL WRITING SCHEME

Akira Nagami, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 29, 1986, Ser. No. 947,451
Claims priority, application Japan, Dec. 26, 1985, 60-294147
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—189.01 8 Claims



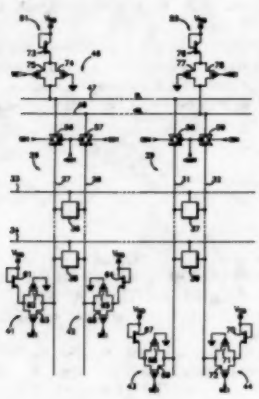
1. A semiconductor memory device comprising; a memory array of a plurality of memory cells arranged in rows and columns, means for selecting one of said rows thereby to enable the memory cells of the selected row for writing data thereto or reading data therefrom through said columns, a random access circuit coupled to said columns of said memory array for performing a random selection of said column for reading data therefrom or writing data thereto in response to column address information, a first terminal, a serial read circuit coupled to said first terminal and said columns for sequentially k outputting at said first terminal data from said columns one by one, a second terminal to which write data are sequentially applied one by one, a serial write circuit couple to said second terminal and to said columns for operatively writing write data sequentially applied to said second terminal to said columns simultaneously, first control means for enabling said serial read circuit, and second control means for enabling said serial write circuit independently of said serial read circuit.

4,899,317

BIT LINE PRECHARGE IN A BIMOS RAM

George P. Hoekstra, Fair Oaks, Calif.; Lal C. Sood, and Samuel E. Alexander, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 1, 1988, Ser. No. 151,044
Int. Cl.[4] G11C 11/40
U.S. Cl. 365—203 12 Claims



1. A memory having a read mode and a write mode and having a first power supply terminal for receiving a positive power supply voltage, comprising:

an array of MOS memory cells respectively coupled to bit line pairs and word lines at intersections thereof, each said MOS memory cell characterized as providing a voltage differential on the bit line pair to which it is coupled when the word line to which it is coupled is enabled when the memory is in the read mode;

a pair of data lines;

column decoder means, coupled to the bit line pairs, for coupling a selected bit line pair to the pair of data lines as determined by a column address;

row decoder means, coupled to the word lines, for enabling a selected word line as determined by a row address;

bit line precharge means, coupled to the bit line pairs, for charging the bit line pairs to one Vbe below the voltage at the first power supply terminal in response to the memory switching from the write mode to the read mode;

sense amplifier means comprised of bipolar transistors and coupled to the data lines for amplifying a voltage differential present on the pair of data lines when the memory is in the read mode; and

wherein the bit line precharge means comprises:

a plurality of bipolar transistors, each bipolar transistor corresponding to an associated bit line and having a base and collector coupled to the first power supply terminal, and an emitter; and

a plurality of coupling means, each coupling means comprising a MOS transistor having a first current electrode coupled to the emitter of an associated bipolar transistor, a second current electrode coupled to the bit line to which the associated bipolar transistor corresponds, and a control electrode for receiving a write enable signal which is responsive to the memory switching from the write mode to the read mode.

4,899,318

METHOD AND DEVICE FOR RECONSTRUCTING THE SHAPE AND POSITION OF OBJECTS IN SPACE

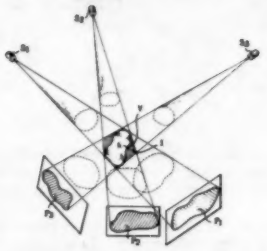
Etienne Schlumberger, Tour Plein Ciel, 8 rue Emile Deslandres, Paris 75013, and Maurice Schlumberger, Le Churut, 38700 Le Chappey en Chartreuse, both of France

Filed Dec. 5, 1988, Ser. No. 279,519
Claims priority, application France, Dec. 9, 1987, 8717140
Int. Cl.[4] G03H 3/00
U.S. Cl. 367—8 12 Claims

1. A method for reconstructing the shape and position of objects in space from at least two projections of these objects obtained by transmission from sources at spaced locations of waves that are modified by passage through said objects, wherein said method comprises the steps of:

(a) determining in respect of each point of each projection the distance traversed through an object by each ray derived from a corresponding one of the sources,

(b) determining a volume which contains the object, the



volume comprising an envelope of all the rays which are derived from the sources and pass through said object,

(c) plotting the distances determined in step (a) from the external limits of the envelope determined in step B,

(d) determining a first space in which the distances plotted in step (c) overlap, said first space being necessarily located inside the object,

(e) plotting the distances determined in step (a) from the external limits of the first space as determined in step (d) so as define a second space, which is necessarily located outside the object and which is more restricted than the envelope determined in step (b),

(f) repeating steps (d) and (e) with the successively determined inner and outer spaces so as to determined, by iteration spaces which are located alternately outside and inside the object in increasing proximity to said object and thus progressively approach the shape and position of the object.

4,899,319

METHOD FOR DETERMINING INDUCED FRACTURE AZIMUTH IN FORMATIONS SURROUNDING A CASED WELL

W. L. Medlin, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 11, 1988, Ser. No. 192,446
Int. Cl.[4] G01V 1/40
U.S. Cl. 367—35 4 Claims

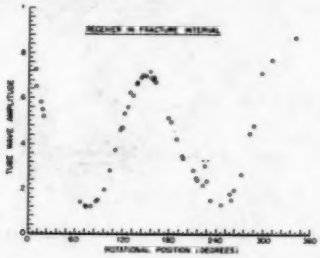
1. A method of acoustic well logging for identifying formation fracture intervals behind a cased well comprising the steps of:

(a) traversing a fluid-filled cased well with a well logging tool containing an asymmetric acoustic energy transducer for producing a positive pressure wave in the fill-fluid in one direction and a negative pressure wave in the fill-fluid in an opposite direction,

(b) rotating said logging tool as it traverses said cased well

(c) exciting said transducer with a plurality of tone bursts on

fixed frequency to drive said transducer to resonate and produce the positive and negative pressure waves in the fill-fluid, the impact of said pressure waves against the casing of said well causing said casing to deflect and produce asymmetric cased well tube waves which travel within said casing,



(d) receiving said asymmetric tube waves at a spaced apart position within said cased well by one or more receivers sensitive to said asymmetric cased well tube waves,

(e) recording the amplitudes of said received cased well tube waves, and

(f) identifying the azimuthal direction of a fracture interval intersected by said cased well from the rotational position of said logging tool at which there is an increased amplitude in said received cased well tube waves.

4,899,320

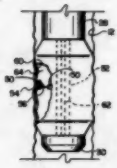
DOWNHOLE TOOL FOR DETERMINING IN-SITU FORMATION STRESS ORIENTATION

David D. Hearn, Richardson; Eric S. Pasternack, and Daniel J. Segalman, both of Plano, all of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation of Ser. No. 751,779, Jul. 5, 1985, abandoned. This application Apr. 29, 1988, Ser. No. 188,728

Int. Cl.[4] G01V *1/00*

U.S. Cl. 367—35 **8 Claims**



1. A method of identifying the orientation of the horizontal in-situ stress field of a formation beneath an earth surface comprising the steps of:

(a) penetrating said formation with a downwardly-directed cylindrical borehole having a sidewall;

(b) exerting adjustable uniform radial pressure against substantially the entire circumference of said sidewall at a desired depth within said formation;

(c) measuring the displacement of said sidewall at said depth in each of a plurality of different radial directions with respect to the longitudinal axis of said borehole corresponding to successively greater values of said pressure;

(d) generating separate signals respectively representative of said displacements;

(e) associating each of said signals with the radial direction of the displacement which it represents;

(f) monitoring said signals in order to compare the relative magnitude of said signals, and

(g) increasing said pressure until said comparison reveals a variation in said displacements from a maximum in at least one of said radial directions to a minimum in at least one other of said radial directions.

4,899,321

METHOD AND APPARATUS FOR DETERMINING THE SOURCE SIGNATURE OF LAND VIBRATORS

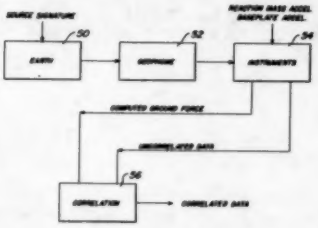
J. J. Solanki, Plano, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 27, 1988, Ser. No. 290,133

Int. Cl.[4] G01V *1/28*

U.S. Cl. 367—48 **6 Claims**

1. In seismic exploration wherein a vibratory seismic source locked at a first one of baseplate phaselock, reaction mass phase lock or ground force phase lock generates vibrative energy into the ground and the amplitude and phase of reflections of said first generated phaselocked vibrative energy is



detected and recorded to produce a first set of seismic data and a vibratory source locked at a second one of baseplate phaselock, reaction mass phaselock or ground force phaselock generates vibrative energy into the ground and the amplitude and phase of reflections of said second generated phaselocked vibrative energy is detected and recorded to produce a second set of seismic data, a method of processing said first and second sets of produced seismic data comprising the steps of:

determining a first computed ground force on the earth during said first generation of vibrative energy;

correlating said first computed ground force with said first set of produced seismic data to produce a first zero phase wavelet imaging the subsurface;

determining a second computed ground force on the earth during said second generation of vibrative energy;

correlating said second computed ground force with said second set of produced seismic data to produce a second zero phase wavelet imaging the subsurface; and

comparing said first and second produced zero phase wavelets to determined if correct imaging of the subsurface has been produced.

4,899,322

INTEGRATED GEOPHYSICAL SURVEY SYSTEM

William C. Crutcher, and Joseph R. Paysinger, both of P.O. Box 965, Katy, Tex. 77492

Filed Oct. 2, 1987, Ser. No. 104,449

Int. Cl.[4] G01V *1/00*

U.S. Cl. 367—59 **5 Claims**

1. Apparatus for conducting a land-based geophysical survey, comprising:

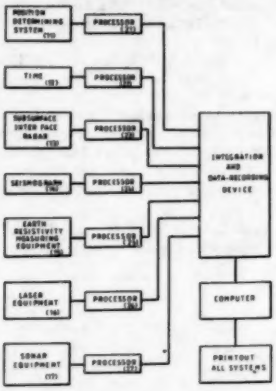
sensor means for measuring selected underground geophysical parameters with said sensor means being land-based and being capable of being designated to measure geophysical parameters, including means for determining a position of an underground object, means for sub-surface interface radar, means for seismography, means for measuring earth-resistivity equipment, means for laser equipment, means for sound-transmitting detection equipment, and means for measuring time;

a series of microprocessors in communication with said sensor means;

a data recording device in communication with said series of microprocessors;

a computer in communication with said data recording device for integrating information collected via said sensor means; and,

means for displaying or printing out of said information.



4,899,323

ANTI-SEISMIC DEVICE

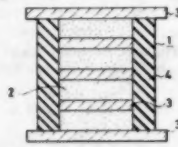
Yoshihide Fukahori, Hachioji; Hiromu Kojima, Higashimurayama; Akihiko Ogino; Shigenobu Suzuki, both of Kodaira, and Toshikazu Yoshizawa, Hachioji, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 306,263, Feb. 1, 1989, abandoned, which is a continuation of Ser. No. 78,621, Jul. 28, 1987, abandoned. This application Apr. 12, 1989, Ser. No. 337,045

Claims priority, application Japan, Aug. 4, 1986, 61-183196; Sep. 16, 1986, 61-217689; Oct. 2, 1986, 61-234897; May 2, 1988, 63-109604

Int. Cl.[4] E04B *1/98*

U.S. Cl. 367—176 20 Claims



1. An anti-seismic device which comprises anti-seismic rubber bearings and dampers arranged in parallel, said anti-seismic rubber bearing being formed by laminating a plurality of rigid hard plates and soft boards having a viscoelastic property one over another, said damper being composed mainly of a viscoelastic material having the physical properties (i) and (ii) defined below.

(i) the hysteresis ratio (h_{50}) is greater than 0.3 at 50% tensile deformation at 25° C.

(ii) the storage modulus (E) measured dynamically at a frequency of 5 Hz, a strain of 0.01%, and a temperature of 25° C. is in the range of $1 \leqq E \leqq 2 \times 10^4$ (kg/cm^2).

4,899,324

CLOCK WITH PENDULAR ELEMENT

Raul Barbieri, and Giorgio Marianelli, both of Via Faruffini, 13, 20149 Milan, Italy

Filed Jul. 8, 1988, Ser. No. 216,800

Claims priority, application Italy, Aug. 4, 1987, 22165/87[U]

Int. Cl.[4] G04B *19/00, 19/06*

U.S. Cl. 368—76 13 Claims

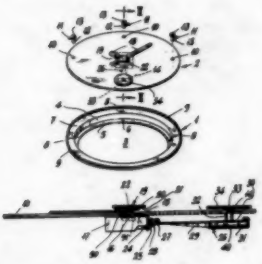
1. A clock comprising

a support for a substantially flat dial,

a clock mechanism for indicating hours, minutes and seconds being secured to a rear side of said substantially flat dial,

a swinging arm arranged to be actuated by said clock mechanism to oscillate,

a pendular member removably connected to said swinging arm, and situated at least partially on the rear side of the dial,



an aperture through said dial and an element positioned on a front side of the dial, said element being connected to said pendular member through said aperture in the dial, wherein

the pendular member comprises an arm with a hook-shaped end for removably engaging an eyelet provided at a free end of the swinging arm which is driven by the clock mechanism.

4,899,325

FINE ACCESS METHOD AND CIRCUIT FOR AN OPTICAL DISK DRIVE USING A MULTI-TRACK JUMP

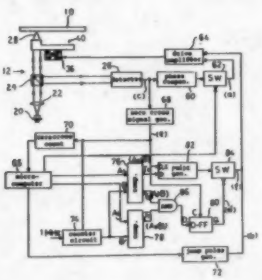
Wataru Katsuhara, Atsugi, and Shigeru Arai, Zushi, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 5, 1988, Ser. No. 190,644

Claims priority, application Japan, May 7, 1987, 62-112047

Int. Cl.[4] G11B *7/00, 21/08*

U.S. Cl. 369—32 14 Claims



1. A method for controlling movement of an access head between acceleration and deceleration jump pulses respectively beginning and ending a single jump of the access head across multiple tracks on a rotating device, said method comprising the steps of:

(a) measuring a time interval required for the access head to travel a predetermined distance across the tracks;

(b) comparing the time interval measured in step (a) with first and second reference time intervals, the first reference time interval being at least as large as the second reference time interval;

(c) applying an acceleration correction pulse to the access head, if said comparing in step (b) indicates that the time interval measured in step (a) is larger than the first reference time interval;

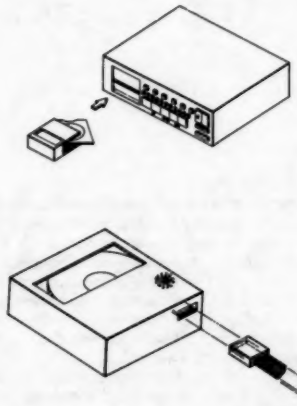
(d) applying a deceleration correction pulse to the access head if said comparing in step (b) indicates that the time interval measured in step (a) is smaller than the second reference time interval.

4,899,326

MAGAZINE-HOUSED DISK PLAYER

Noriyoshi Takeya; Hidehiro Ishii; Osamu Watanabe; Junichi Yoshio; Kazuhiko Katakami, and Takeshi Izumo, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 15, 1987, Ser. No. 108,607
Claims priority, application Japan, Oct. 15, 1986, 61-244965; Oct. 28, 1986, 61-258031; Nov. 18, 1986, 61-274986; Nov. 18, 1986, 61-274987; Nov. 18, 1986, 61-274988; Dec. 26, 1986, 61-311260; Dec. 26, 1986, 61-311261
Int. Cl.[4] G11B *17/00, 5/48*
U.S. Cl. 369—36 9 Claims



1. A disk player for playing disks housed in a plurality of magazines, each magazine identified by a different identification mark carried by the magazine and in which a selected one of said plurality of magazines containing one or more disks and carrying an identification mark thereon to identify that magazine is loaded, said disks of said loaded magazine being selectively moved to a reproducing section and reproduced, comprising:

reproduction control means for controlling said reproducing section in accordance with a command;

memory means in the player for storing magazine content information indicative of the contents of the disks housed in each of said plurality of magazines; and

reading means for reading said identification mark carried by the one of said magazines loaded into said player and for causing said magazine content information corresponding to the magazine identified by the read identification mark to be read from said memory means.

4,899,327

FOCUS SERVO LOOP CORRECTION

Keith A. Bates, Lafayette; Russell A. Budd, Longmont; Millard A. Habegger, Boulder, and Mark L. Rhoades, Longmont, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 698,517, Feb. 4, 1985, abandoned. This application May 4, 1987, Ser. No. 52,115
Int. Cl.[4] G11B *7/08, 21/00*; H04N *5/76*
U.S. Cl. 369—45 3 Claims

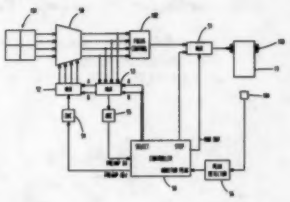
1. In an optical disc apparatus having

means including a laser for supplying energy to read and to write information on an optical disc,

monitor diode means responsive to energy reflected through the laser for supplying a feedback signal to control the laser energy output power, and

means for focussing said energy on a read plane on the optical disc, the improvement comprising:

means for establishing substantial best focus comprising



peak detecting means responsive to said feedback signal for supplying a signal indicative that a peak value in said feedback signal has been attained,

means responsive to the peak value signal for setting a reference signal; and

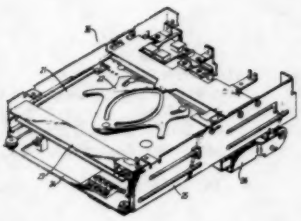
means for controlling said focussing means with respect to the reference signal.

4,899,328

DATA REPRODUCING APPARATUS AND METHOD FOR LOCKING A REPRODUCING HEAD

Masaru Ishii, Fujisawa, and Kazuharu Odawara, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Jun. 3, 1987, Ser. No. 56,901
Claims priority, application Japan, Jun. 13, 1986, 61-137881
Int. Cl.[4] G11B *3/10, 7/00*
U.S. Cl. 369—77.2 4 Claims



1. An apparatus for reproducing data form a data storage medium, comprising:

head means, disposed opposite the data storage medium, for processing data from the data storage medium, said head means including a catching portion integrally formed thereon;

means for moving the head means and said integral catching portion between first and second spaced positions along a radial direction of the data storage medium;

lock means, having a hook member, for engaging with the catching portion of the head means, said hook member being configured to securely mate with said catching portion thereby preventing movement of the head means;

means for manually inputting a start command signal to the moving means for initiating movement of said head means; and

means for releasing the engaging state of the lock means in response to the start command signal from the start command signal input means.

4,899,329

OPTICALLY READABLE DISC WITH A CENTERING MEMBER FIXED TO A TRANSPARENT SUBSTRATE

Franciscus T. Sleegers; Pieter D. Schuitmaker, and Peter J. M. Janssen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

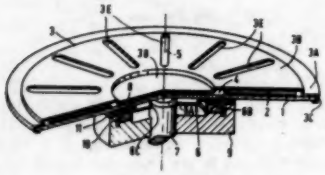
Filed May 2, 1983, Ser. No. 490,801

Claims priority, application Netherlands, Feb. 9, 1983, 8300479

The portion of the term of this patent subsequent to Apr. 9, 2002, has been disclaimed.

Int. Cl.[4] G11B *7/24, 23/14*

U.S. Cl. 369—275 3 Claims



1. An optically readable disc adapted to be driven about a central axis of rotation, comprising a round transparent substrate and an information layer disposed to one side of the substrate,

characterized in that the substrate comprises a substantially rigid disc without aperture, said disc being flat at least on the side where the information layer is disposed, and

an axially projecting central centering member of ferromagnetic material disposed on the other side of the substrate and joined thereto by a layer of glue, said centering member cooperating with centering means of an apparatus for inscribing and/or reading optically readable discs.

4,899,330

ADAPTOR FOR MINI CD

Hermanus F. Einhaus, Ham, Belgium, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 2, 1988, Ser. No. 239,809

Claims priority, application Netherlands, Sep. 16, 1987, 8702202

Int. Cl.[4] G11B *23/00*

U.S. Cl. 369—289 8 Claims

1. An adaptor comprising:

an annular body having an inner rim which bounds a centre hole in which said disc record can be placed, which annular body has an outer diameter which is substantially larger than the outer diameter of said optical disc;

an annular sheet of material substantially thinner than said annular body, said annular sheet affixed to a surface of said annular body and having an inner rim which bounds a center hole smaller than the center hole in said annular body; and

an a layer of adhesive on the portion of said annular sheet of material that is accessible through the center hole of said annular body.

4,899,331

RANDOM REPRODUCING SYSTEM FOR DISK PLAYER

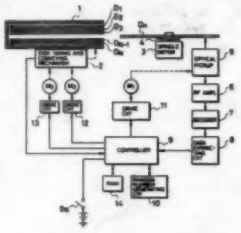
Naoki Masaki, and Masayuki Yoshida, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 26, 1987, Ser. No. 113,693

Claims priority, application Japan, Oct. 24, 1986, 61-163431; Oct. 31, 1986, 61-260424[U]

Int. Cl.[4] G11B *17/22, 27/19*

U.S. Cl. 369—32 4 Claims



1. A disk player, comprising:

playing means for playing one disk of one or more disks and including a controllably movable mechanical component;

numerical value forming means for forming a numerical value which changes at predetermined time intervals;

means for starting said numerical value forming means and for controlling said mechanical component to begin movement from a first position to a second position;

means for determining that said mechanical component has moved to said second position;

means responsive to said determining means for reading a current value from said numerical value forming means when said mechanical component has moved to said second position and for using said current value for randomly selecting one piece from said one or more disks for playing by said playing means.

4,899,332

DATA TRANSMISSION/RECEPTION SYSTEMS FOR ELECTRO-HYDRAULIC CONTROL SYSTEMS

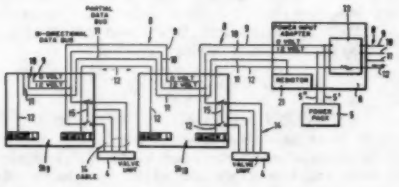
Johannes König, Munich, Fed. Rep. of Germany, assignor to Gewerkschaft Eisenhutte Westfalia GmbH, Fed. Rep. of Germany

Filed May 9, 1988, Ser. No. 191,550

Claims priority, application Fed. Rep. of Germany, May 9, 1987, 3715588

Int. Cl.[4] H04J *15/00*; E21D *23/12*

U.S. Cl. 370—32 9 Claims



1. An electro-hydraulic control system comprising control units associated with roof supports, said control units serving to actuate electro-magnetic valves and being arranged in groups with each group of control units allocated to several adjacent supports having an intrinsically safe D.C. electrical energy source associated therewith, microcomputer-controlled data transmission and reception stations which are

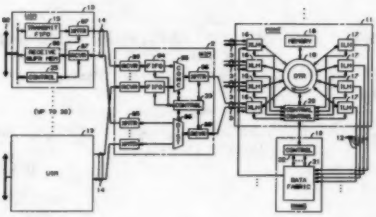
associated with the control units, a bi-directional data bus interconnecting adjacent pairs of the transmission and reception stations and a partial-bus which overlaps the transmission and reception stations of the groups of the control units and forms a further data channel with which the transmission and reception stations of the control units of the relevant group are coupled for data communication; wherein the bi-directional data bus is a single-wire data bus for simultaneous transmission and reception of data between the transmission and reception stations of an adjacent pair of said control units and forms a summation point for the addition of the transmission signals of the stations, each of the transmission and reception stations is provided with a subtraction circuit with an output connected to the receiver of the relevant transmission and reception station, a first input to which the transmission signals of the transmitter of the relevant transmission and reception station are conveyed and a second input connected to the bi-directional data bus.

4,899,333

ARCHITECTURE OF THE CONTROL OF A HIGH PERFORMANCE PACKET SWITCHING DISTRIBUTION NETWORK

Gary A. Roediger, Downers Grove, Ill., assignor to American Telephone and Telegraph Company AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 31, 1988, Ser. No. 175,542
Int. Cl.[4] H04J 3/26
U.S. Cl. 370—60 **10 Claims**



1. In a data network having a plurality of inlets and outlets, said network comprising first data switching means for switching received data packets, each packet comprising destination information, from at least one input terminal to at least one output terminal, said data switching means comprising a control means comprising:

a plurality of first processors for controlling the storing of each of said received data packets in a memory means; and

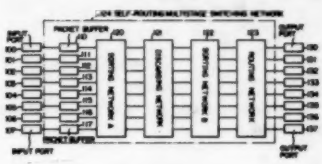
a plurality of second processors, responsive to said destination information of said received data packets, for ascertaining an identity of an outlet for reaching a destination specified by said destination information of each data packet, and for linking, for each outlet of said network, memory locations in said memory means of data packets whose destinations are reachable via said each outlet, wherein each of said packets further comprises source information, wherein said second plurality of processors comprises at least one processor for verifying authority of a source, identified by said source information of a packet, to transmit said packet.

4,899,334

SELF-ROUTING MULTISTAGE SWITCHING NETWORK FOR FAST PACKET SWITCHING SYSTEM

Shogo Shimizu, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Oct. 11, 1988, Ser. No. 256,405
Claims priority, application Japan, Oct. 19, 1987, 62-261639; Nov. 9, 1987, 62-281152
Int. Cl.[4] H04J 3/26
U.S. Cl. 370—60 **4 Claims**



1. A self-routing multistage switching network for a fast packet switching system for transmitting a plurality of packets applied to a plurality of input ports to a plurality of output ports, comprising:

(a) packet buffer means capable of storing packets, provided only in an input stage, and respectively connected to the input ports;

(b) self-routing multistage switching means, including a switching network connected to the output terminals of the packet buffer means, for routing a packet over a variable transmission route, having no packet storing function, and including a plurality of unit switches capable of self-routing control;

(c) detecting means for detecting beforehand whether or not the packets applied to the self-routing multistage switching means are transmitted through the selfrouting multistage switching means without being discarded;

(d) reporting means for reporting identification information which identifies a packet which can be transmitted instead of being discarded, backward to the packet buffer means through the same transmission route of the self-routing multistage switching means through which the packet has been transmitted; and

(e) control means for deleting a packet from a storage means of the packet buffer means after completion of sending out of a packet, if the packet is identified by the identification information given to the packet buffer means by the reporting means as a packet which can be transmitted instead of being discarded

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4,899,335

SELF ROUTING PACKET SWITCHING NETWORK ARCHITECTURE

James M. Johnson, Jr., and Ronald A. Spanke, both of Wheaton, Ill., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 21, 1988, Ser. No. 287,775
Int. Cl.[4] H04J 3/26
U.S. Cl. 370—60 **13 Claims**

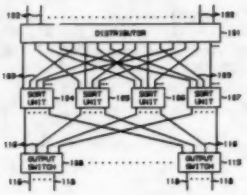
1. A packet routing arrangement for routing packets including destination information comprising:

a plurality of output switch means, each output switch means comprising a plurality of output ports, for routing packets received thereby to said output ports;

input means for receiving said packets and responsive to said destination information thereof for distributing said received packets to a plurality of intermediate means such that each intermediate means receives approximately the same number of said packets destined for each output switch means as other intermediate means; and

each of said intermediate means comprises means responsive

to said destination information for identifying packet groups with a common output switch means destination



and for transmitting said groups of packets to said output switch means.

4,899,336

CENTRALLY CONTROLLED TELECOMMUNICATIONS EXCHANGE SYSTEM

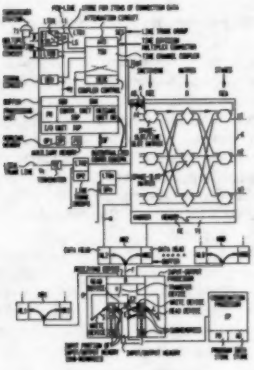
Hans Baur, Starnberg, and Hans Bittermann, Neuried, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 1, 1988, Ser. No. 201,497

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1987, 3719517

Int. Cl.[4] H04Q *3/545, 11/04*

U.S. Cl. 370—63 **5 Claims**



1. A centrally controlled telecommunications exchange system comprising:

a central section including a central switching network and a central coordination processor;

decentral line trunk groups each including a subsidiary switching network, connected to the central switching network via connection paths for establishing dialed connections, and a program-controlled subsidiary control unit for switching-through connections via said subsidiary switching network, the line trunk groups being connected via connection-individual and/or subscriber-individual terminating circuits to respective connection and/or subscriber lines and to corresponding channels in transmission systems; and

a control channel extending from the central coordination processor to the subsidiary control units; wherein

the central coordination processor, in association with the start of the switching operation of a respective line trunk group, transmits to said line trunk group, peripheral data items which are obtained from a central store assigned to the central coordination processor and which are stored semi-permanently by this line trunk group decentrally in an assigned store, and which consist in part of items of program information for its switching-orientated program control sequences and in part of items of connection data which are individually assigned to the terminating circuits and to the connected channels and which govern the switching and control operation in each individual case, including subscriber number, subscriber connection state, assignment data, operating state data, operating category data, subscriber type date, connection line type and channel type data, the transmission of the peripheral data to each of the line trunk groups comprising a first transmission procedure which is carried out prior to the start of its respective switching operation sequence on the one hand, and a second transmission procedure following the start of the switching operation sequence on the other hand, the first transmission procedure transmitting only the items of program information, and the second transmission procedure including a plurality of individual subsidiary transmission procedures which, during the already started operating sequence, are inserted into a data exchange, which is used for this purpose, between the central coordination processor and the subsidiary control units in such manner that, in the case off every incoming or outgoing seizure which takes place for the first time following the respective state to the switching operation sequence, of in each case one of the connection-individual and/or subscriber-individual terminating circuits or one of the corresponding connected channels, the respective line-individual channel-individual items of connection data, which in some cases are firstly requested by the respective subsidiary control unit, are transmitted from the central coordination processor individually in respect of each one of the connection-individual and/or subscriber-individual terminator circuits and each corresponding channel, to the respective line trunk group and are stored in the store thereof.

4,899,337

TIME DIVISION MULTIPLEXER WITH AUTOMATIC CALL FUNCTION

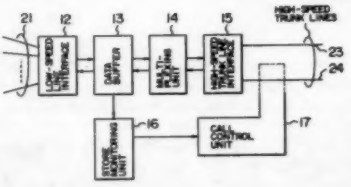
Masato Hirai, Hadano, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 9, 1988, Ser. No. 230,063

Claims priority, application Japan, Aug. 17, 1987, 62-203011

Int. Cl.[4] H04J *3/17*

U.S. Cl. 370—80 **10 Claims**



1. A multiplexer for trunking, over at least one high-speed trunk line on a multiplex basis under statistical time-division multiplexing control, transmission data on low-speed lines connected to a plurality of data terminal units, said statistical time-division multiplexer comprising:

a data buffer which temporarily stores data to be sent from said low-speed lines to said high-speed trunk line and data to be sent from said high-speed trunk line to said low-speed lines;

a multiplexing line interface unit which sends out data stored in said data buffer over said high-speed trunk line on a multiplex basis and converts multiplexed data received on

said high-speed trunk line into data for each terminal unit and sends the converted data to said data buffer, said interface unit being normally connected with at least one leased high-speed trunk line;

a store monitoring unit which monitors the quantity of low-speed line data stored in said data buffer and generates a call control signal for calling a public line intended for multiplexed data high-speed trunking when the quantity of stored data has exceeded a predetermined level; and

a call control unit connected between said store monitoring unit and said high-speed trunk line which, in response to said call control signal received from said store monitoring unit, calls said public line and connects said public line to said multiplexing line interface unit as a high-speed trunk line in addition to said leased high-speed trunk lines.

4,899,338

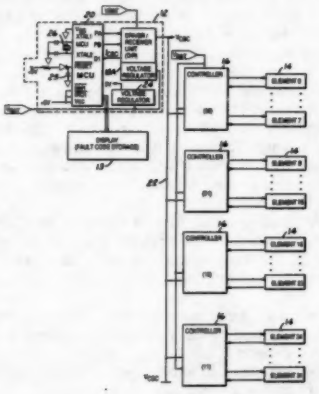
ELECTRICAL DEVICE COMMAND SYSTEM, SINGLE WIRE BUS AND SMART OCTAL CONTROLLER ARRANGEMENT THEREFOR

Thomas R. Wroblewski, Sterling Heights, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Dec. 15, 1988, Ser. No. 284,886

Int. Cl.[4] H04J 3/14

U.S. Cl. 370—85.1 **8 Claims**



1. A multiplex system within a motor vehicle for commanding and monitoring the status of a plurality of electrical devices or elements disposed throughout the motor vehicle, each of the elements having command terminals for receiving commands in the form of a voltage signal for activating or deactivating each of the elements, each of the command terminals also being used to provide a status indication in the form of a current signal upon being commanded, said system comprising:

(a) a bi-directional, single wire bus for transmitting voltage signals in a first direction and current signals in a second direction, said bus being routed throughout the vehicle, said voltage and said current signals being developed in said multiplexed system;

(b) a plurality of smart octal controllers disposed throughout the motor vehicle, each of said plurality of controllers having (1) a single input/output terminal connected by a single wire to a single point along said bus for receiving the transmitted voltage signals from said bus and for sending the current signals to said bus; (2) a pair of input power lines connected across a power source of the vehicle; (3) a group of eight output command lines with each line from the group coupled to one of the elements disposed throughout the vehicle for commanding ON or OFF the element; (4) a group of eight status lines with each line from the group coupled to a corresponding one of the elements; and (5) means for a preprogrammed identifying address;

each of said plurality of controllers providing command signals to the eight elements for turning ON or OFF an individual element of said group; each of said plurality of controllers receiving in response to the command, a current signal indicative of the status of a commanded element;

(c) a driver and receiver means connected to the power source of the vehicle and a terminal of said single-wire bus for generating an undulating voltage signal containing a series of dual-duty cycle voltages forming the address and command information of which a first portion of the address information is used to address one of said plurality of controllers, one of said plurality of controllers being addressed if the first portion of the address information matches the predetermined address code, and of which a second portion of the address information is used to enable said addressed controller to command the operation of a selected element connected thereto;

said undulatory voltage signal being driven onto said bus and into each of said plurality of controllers by said driver and receiver means, said driver and receiver means also having means for receiving from said bus the current signals sent over said bus by each of said addressed controllers indicative of the status of the commanded element;

(d) display means for displaying the status of each of the commanded elements; and

(e) a microcomputer means interconnecting said driver and receiver means and display means for (1) writing logic commands to said driver and receiver means for controlling the generation of the undulatory voltage used to develop the address and command information placed on said bus for addressing and commanding each of said plurality of controllers in order to cause each of said plurality of controllers to operate the elements connected thereto, (2) reading current signals indicative of the status of the commanded element that is sent by said addressed controller, (3) establishing a history of performance of each of the commanded elements and (4) transferring updated status information to said display means.

4,899,339

DIGITAL MULTIPLEXER

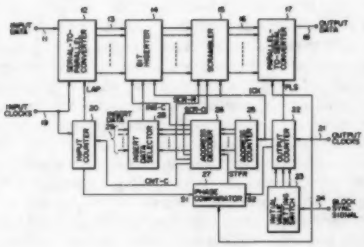
Taro Shibagaki, Tokyo; Takehiko Atsumi, Ichikawa; Hiroyuki Ibe, Yokohama, and Sadao Tanikoshi, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 7, 1988, Ser. No. 254,847

Claims priority, application Japan, Oct. 9, 1987, 62-254996; Oct. 9, 1987, 62-254997; Oct. 9, 1987, 62-254998; Oct. 9, 1987, 62-254999; Oct. 9, 1987, 62-255000

Int. Cl.[4] H04J 3/06

U.S. Cl. 370—102 **18 Claims**



1. A framing unit used for a digital multiplexer comprising: serial-to-parallel converting means having m parallel output

lines, for converting serial input data to parallel data of m bits or (m+n) bits of less than m bits by at least one bit, and issuing the parallel data onto m output lines or (m−n) output lines of less than m output lines by at least one line;

switching means for selectively switching the parallel data issued by said serial-to-parallel converting means between m bits and (m−n) bits;

framing means connecting to said output lines, for inserting at least one control bit necessary for framing into said at least one output line when the (m−n)-bit parallel data are issued from said serial-to-parallel converting means; and

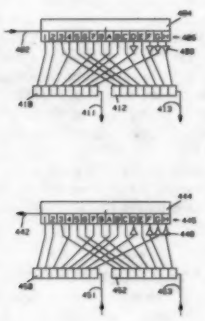
parallel-to-serial converting means for converting output data of said framing means to serial data.

4,899,340

ERROR CORRECTING CODE AND ERROR CORRECTING CIRCUIT USING THE SAME

Daniel P. Lubarsky, San Jose, Calif., assignor to Pacific Bell, San Francisco, Calif.

Filed Jun. 28, 1988, Ser. No. 212,601
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—37.1 **9 Claims**



1. An error correcting circuit comprising:

means for receiving an n-bit received digital word, including means for coupling said error correcting circuit to an incoming user line;

means for transmitting first and second transmission encrypted words on first and second outgoing transmission lines, said first transmission encrypted word having n_1 bits and said second transmission encrypted word having n_2 bits, said transmitting means including means for encrypting said received digital word according to an error correcting code to form said first and second transmission encrypted words, wherein said first and second transmission encrypted words are different from 0 for all possible values of said n-bit digital word; and

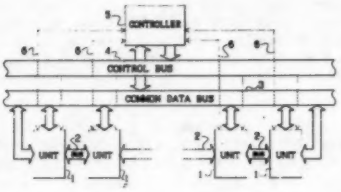
means for receiving first and second reception encrypted words on first and second incoming transmission lines, respectively, said first reception encrypted word having n_1 bits and said second reception encrypted word having n_2 bits, said receiving means including means for decrypting said first and second reception encrypted words using said error correcting code to form an n-bit transmitted digital word and means for coupling said n-bit transmitted digital word to an outgoing user line.

4,899,341

ERROR CORRECTION CIRCUIT

Yasuharu Tomimitsu, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 28, 1988, Ser. No. 149,447
Claims priority, application Japan, Jan. 28, 1987, 62-19301
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—37.6 **3 Claims**



3. An error correction circuit comprising:

(a) a plurality of Galois field operation units coupled in cascade through a first bus and operated in parallel, each of said units including:

(1) a register file coupled to receive data to be corrected,

(2) A Galois field multiplication circuit having a first input connected to the data stored in said register file and a second input connected to receive another data through the first bus from a first adjacent unit, and

(3) a Galois field addition circuit having a first input connected to an output of said Galois field multiplication circuit and a second input connected to receive another data through the first bus from said adjacent unit, an output of said Galois field addition circuit being connected to a second adjacent unit through the first bus; and

(b) a controller coupled to said plurality of Galois field operation units through a second bus provided independently of said first bus, said controller unit including:

(1) a memory storing the data to be corrected, a register file,

(2) a Galois field multiplication circuit having a first input coupled to said memory and a second input connected to said register file,

(3) an arithmetic logic unit connected to an output of said Galois field multiplication circuit, and

(4) a microprogram control unit for controlling the operations of said plurality of Galois field operation units.

4,899,342

METHOD AND APPARATUS FOR OPERATING MULTI-UNIT ARRAY OF MEMORIES

David Potter, Acton; Laurence N. Provost, Arlington; John M. Baron, Grafton; David Stefanovic, Allston; Eric D. Sharakan, Brighton; David A. Sheppard, Cambridge, and Marshall A. Isman, Newton, all of Mass., assignors to Thinking Machines Corporation, Cambridge, Mass.

Filed Feb. 1, 1988, Ser. No. 150,814
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—10.1 **18 Claims**

1. A multi-unit memory system comprising:

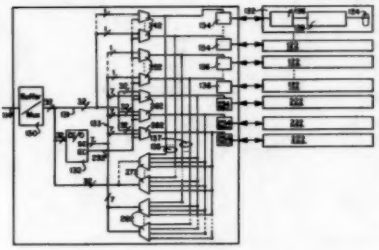
an error correction code generation circuit which generates for each block of data to be stored in said memory system an error correction code, each block of data comprising a first plurality of digits and each error correcting code comprising a second plurality of digits from which at least one digit of error may be detected and corrected in the block of data,

a plurality of read/write memory units, which store the digits of said blocks of data and associated error correction codes generated by said error correction code generation circuit and read said digits, at least some of the differ-

ent digits of each code and its associated data block being stored in different memory units,

at least one spare read/write memory unit that is similar in operation to an individual read/write memory unit of said plurality of read/write memory units,

means for generating from the digits of a block of data and associated error correction code read from said memory units a digit which corrects an error in a digit read from



one of said memory units, said generating means operating on a sequence of said blocks of data and associated error correction codes to generate a sequence of correct digits, and

means for accessing the spare read/write memory unit to store therein said sequence of correct digits as the sequence of blocks of data and associated error correction codes are read from the plurality of read/write memory units.

4,899,343

LASER LAYOUT

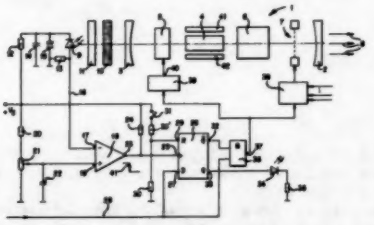
Daniel Wildmann, Dielsdorf, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Jan. 5, 1989, Ser. No. 293,337

Claims priority, application Switzerland, Jan. 20, 1988, 183/88

Int. Cl.[4] H01S *3/10*

U.S. Cl. 372—9 **20 Claims**



1. Laser layout comprising:

an optical resonator chamber bounded by a fully reflecting mirror and a partially reflecting mirror;

an active laser medium and a crystal for generating second and higher harmonics located in said chamber;

a power sensor device provided outside the resonator chamber in an approximate alignment with a longitudinal axis of the resonator chamber near the fully reflecting mirror, said power sensor including:

a scatter disk for scattering light energy received from said chamber;

a filter for absorbing frequency doubled wavelength of the laser medium and the wavelength of a pumping light; and,

an optical sensor for receiving light energy from said scatter disk and being connected with a comparator circuit, an output of said power sensor being used to actuate a device to deactivate the laser layout.

4,899,344

SEMICONDUCTOR LASER CONTROL APPARATUS

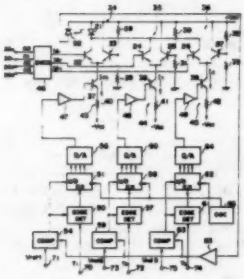
Isamu Shibata, Fuchu; Takahiro Asai, Yokohama; Kiyoto Nagasawa, Yokohama, and Kenichirou Asada, Tokyo, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Dec. 2, 1988, Ser. No. 279,211

Claims priority, application Japan, Dec. 7, 1987, 62-308938; Jan. 14, 1988, 63-4853; Feb. 12, 1988, 63-30661; Feb. 25, 1988, 63-43049

Int. Cl.[4] H01S *3/13*

U.S. Cl. 372—29 **20 Claims**



1. A semiconductor laser control apparatus for controlling an optical output of a semiconductor laser to a predetermined value, said semiconductor laser control apparatus comprising:

switching means coupled in series with the semiconductor laser and controlled by an N-bit image signal;

N constant current supply circuits coupled in parallel to each other and in series with said switching means for supplying currents to said switching means so that a driving current is supplied to the semiconductor laser from said switching means;

detector means for detecting the optical output of the semiconductor laser and for outputting a detection signal indicative of the detected optical output; and

control means responsive to the detection signal from said detector means for controlling the driving current by controlling said N constant current supply circuits so that the optical output of the semiconductor laser becomes the predetermined value.

4,899,345

ATOMIC RESONANCE IN CROSSED LINEAR POLARIZATION

Normand Cyr, Ste-Foy; Michel Têtu, Cap-Rouge, both of Canada, and Vincent Giordano, Orsay, France, assignors to Universite Laval, Quebec, Canada

Filed Apr. 21, 1989, Ser. No. 341,209

Int. Cl.[4] H01S *3/13*

U.S. Cl. 372—32 **19 Claims**

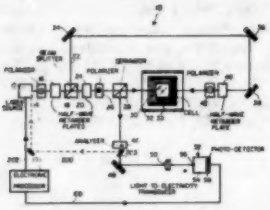
1. In combination:

a cell containing a medium capable to manifest light absorption resonance;

means for generating substantially collinear pump and probe light beams propagating toward said cell in opposite directions to interact with the said medium, said pump and probe light beams having linear polarizations which are generally orthogonal;

means for producing a substantially non-fluctuating magnetic field within said cell to allow the said medium to

manifest a particular state of light absorption resonance when the frequencies of said pump and probe light beams are located within a narrow absorption resonance frequency bandwidth characterizing said medium; and



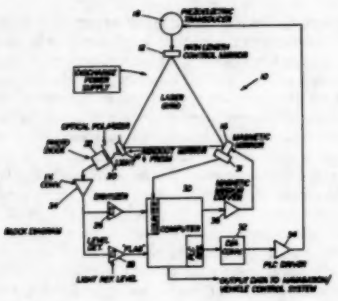
means responsive to the polarization of the probe beam transmitted through said medium, optically coupled to said cell for generating an output signal indicative of said particular state of absorption resonance.

4,899,346

PATH LENGTH CONTROL SYSTEM FOR MAGNETIC MIRROR DITHERED RING LASER GYROS

Harley A. Perkins, Brookline, Mass., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Jan. 21, 1988, Ser. No. 146,443
Int. Cl.[4] H01S 5/13
U.S. Cl. 372—32 **9 Claims**



1. A laser gyro including means forming a resonant cavity; an active media disposed in said cavity; mirror means coupled to said cavity to form a ring laser gyro, said mirror means including a path control mirror, an output mirror, and a magnetic mirror having two magnetization states to magnetically dither said gyro between two laser light output frequencies $f_{up}f_{dn}$; and means for exciting said cavity into laser oscillation, the improvement comprising:

means for detecting said output frequencies f_{up}, f_{dn} of the two states of magnetization,

means for computing a reference frequency, f_o, characteristic of the magnetic mirror,

means for computing a path length error signal from the output frequencies f_{up}, f_{dn} and from the reference frequency f_o,

means for moving said path length control mirror,

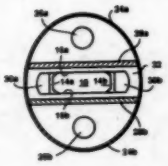
means for generating a drive signal from said path length error signal, said drive signal being connected to said means for moving said path control mirror, aid means for moving being responsive to said drive signal for moving said path length control mirror to a position corresponding to zero path length error signal.

4,899,347

SOLID STATE LASER GAIN MEDIUM WITH DIAMOND COATING

Norman R. Kuchar, Burnt Hills, and Farzin H. Azad, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 11, 1989, Ser. No. 350,265
Int. Cl.[4] H01S 3/00
U.S. Cl. 372—33 **20 Claims**



1. An article comprising:

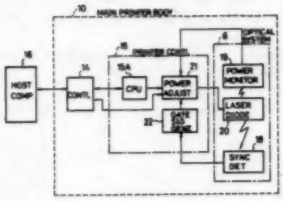
a solid state laser gain medium having an outer surface, and means for reinforcing said medium and for reducing parasitic oscillations comprising a diamond coating disposed on at least a portion of said outer surface.

4,899,348

METHOD AND APPARATUS FOR CONTROLLING OPTICAL OUTPUT OF LASER LIGHT SOURCE

Yukitoshi Kiya, Kawasaki, and Kazuyuki Shimada, Chofu, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 20, 1988, Ser. No. 287,335
Claims priority, application Japan, Dec. 29, 1987, 62-336548; Jan. 27, 1988, 63-14560
Int. Cl.[4] H01S 3/00
U.S. Cl. 372—38 **9 Claims**



1. A method of controlling an optical output of a laser light source which scans a photosensitive body, said method comprising the steps of:

detecting an optical output of the laser light source and generating a monitor signal which has a logic level indicative of whether a laser power of the optical output is greater than or less than a predetermined value;

generating signals including a gate signal indicative of a scan time in which the photosensitive body is scanned based on a synchronization detection signal indicative of each scanning line, first and second laser diode signals respectively having logic levels for turning the laser light source ON and OFF and first and second enable signals based on said monitor signal, said gate signal and a power set start signal indicative of a start of a power set operation in which the laser power is controlled to said predetermined value, said first laser diode signal having a logic level for tuning the laser light source ON during an entire time in which said gate signal has a predetermined logic level corresponding to the scan time in which the photosensitive body is scanned even when said monitor signal undergoes two successive transitions before an end of the time in which

said gate signal has said predetermined logic level, said first enable signal having a logic level for enabling an adjustment of a driving current supplied to said laser light source only when said gate signal has said predetermined logic level until the logic level of said monitor signal undergoes two successive transitions, said second laser diode signal having the logic level for turning the laser light source ON during a time from a start of said power set start signal to a time when the logic level of said monitor signal undergoes two successive transitions, said second enable signal having a logic level for enabling the adjustment of said driving current during a time when said second laser diode signal has the logic level for turning the laser light surface ON;

selectively outputting said first laser diode signal and said first enable signal respectively as a selected laser diode signal and a selected enable signal in a first mode and outputting said second laser diode signal and said second enable signal respectively as the selected laser diode signal and the selected enable signal in a second mode; and

adjusting said driving current supplied to said laser light source based on said monitor signal when enabled by said enable signal so as to control the laser power to said predetermined value.

4,899,349

SEMICONDUCTOR LASER DEVICE

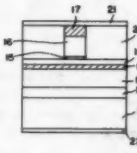
Toshiro Hayakawa, Nara; Takahiro Suyama, Tenri; Kohsei Takahashi, Tenri; Masafumi Kondo, Tenri, and Saburo Yamamoto, Haibara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 885,920, Jul. 15, 1986, abandoned. This application Dec. 14, 1988, Ser. No. 285,342

Claims priority, application Japan, Jul. 18, 1985, 60-160941

Int. Cl.[4] H11S *3/19*

U.S. Cl. 372—44 **5 Claims**



1. In a semiconductor laser device, a double-heterostructure multi-layered crystal containing an active layer for laser oscillation and including a striped etching-protective thin layer formed on said double-heterostructure multi-layered crystal, a stripped-mesa mesa multi-layered crystal formed on said striped etching-protective thin layer and includes a cladding layer, and a burying layer formed on said double-heterostructure multi-layered crystal outside outside of both the striped thin layer and the striped-mesa multi-layered crystal, wherein said cladding layer and said burying layer contain aluminum and wherein a ratio of the aluminum mole ratio of said burying layer to the aluminum mole ratio of said cladding layer is at least approximately 1,6, thereby providing refractive index distributions within said active layer corresponding to the inside and the outside of said striped-mesa multi-layered crystal and providing a striped structure functioning as a current path composed of said striped-mesa mult-layered crystal.

4,899,350

SIGNAL COMMUNICATION CAPABLE OF AVOIDING AN AUDIBLE REPRODUCTION OF A SEQUENCE OF INFORMATION SIGNALS

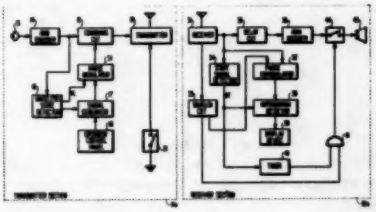
Kouzou Kage, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 18, 1987, Ser. No. 50,431

Claims priority, application Japan, May 16, 1986, 61-111988; May 16, 1986, 61-111989

Int. Cl.[4] H04L *27/10*

U.S. Cl. 375—52 **12 Claims**



1. A signal transmission device for use in transmitting a sequence of output digital signals to a signal reception device, said signal transmission device comprising adaptively converting means for adaptively converting a voice signal into a sequence of digital voice signals within an audible frequency range and information signal producing means for producing a sequence of digital information signals which has a signal component which is preceded by a digital start signal, wherein the improvement comprises:

phase modulation means coupled to said information signal producing means for phase-modulating said digital information signal sequence which has a signal component preceded by said digital start signal into a phase-modulated signal which has a signal distribution falling within an inaudible frequency region different from said audible frequency range, so that said phase-modulated signal is thereby not audibly reproduced by said signal reception device even when said digital start signal is wrongly detected by said signal reception device; and

combining means coupled to said adaptively converting means and said phase modulation means for combining said digital voice signal sequence with said phase-modulated signal into a combined signal sequence; and

transmitting means coupled to said combining means for transmitting said combined signal sequence to said signal reception device as said output digital sequence.

4,899,351

TRANSIENT FREE CLOCK SWITCH LOGIC

Carl Bonke, Rancho Santa Margarita, Calif., assignor to Western Digital Corporation, Irvine, Calif.

Filed Jul. 18, 1988, Ser. No. 220,534

Int. Cl.[4] H04L *7/00*

U.S. Cl. 375—108 **6 Claims**

1. A clock switching circuit for selectively enabling first and second clocks comprising

means for selecting the first or second clock, the selection means having a selection signal output;

first means for synchronizing the selection signal output to the first clock;

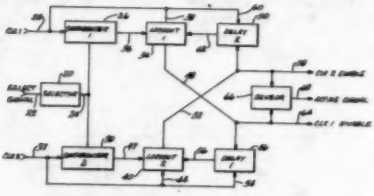
second means for synchronizing the selection signal output to the second clock;

a first lock-out circuit having a first input responsive to the first synchronizer means; a second input responsive to the first clock, a third enabling input and an output providing a first clock enable signal;

a second lock-out circuit having a first input responsive to the second synchronizer means; a second input responsive

to the second clock; a third enabling input and an output providing a second clock enabling signal;

a first delay circuit responsive to the second clock driven by the output of the first lockout circuit and having an output connected to the third input of the second lockout circuit; and,



a second delay circuit responsive to the first clock driven by the output of the second lockout circuit and having an output connected to the third input of the first lockout circuit.

4,899,352

SYSTEM AND DEVICE TO INTERFACE ASYNCHRONOUS APPARATUSES

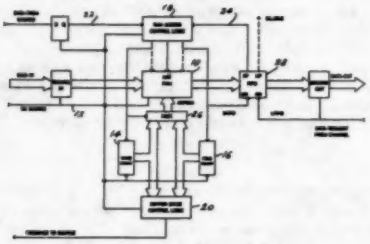
Silvio Cacchi, Gaggiano, and Vittorio Corradi, Monza, both of Italy, assignors to Telettra Telefonia Elettronica e Radio S.p.A., Milan, Italy

Filed Sep. 23, 1987, Ser. No. 100,022

Claims priority, application Italy, Sep. 25, 1986, 21810 A/86

Int. Cl.[4] H03K *5/135*

U.S. Cl. 375—118 **5 Claims**



1. A system for interfacing asynchronous equipment operating a different clock frequencies, comprising:

(a) a single-port RAM synchronized with the clock of the asynchronous equipment having the higher frequency;

(b) a FIFO memory coupled to said single-port RAM; and

(c) priority logic which controls read/write access to said single-port RAM from said asynchronous equipment and which, in the event of a conflict arising from simultaneous read/write requests from said asynchronous equipment, gives the request from the asynchronous equipment having a higher clock frequency priority access to said single-port RAM, the request from the asynchronous equipment having a lower clock frequency being fulfilled by read/-write to said FIFO memory.

4,899,353

INITIAL VALUE SETTING SYSTEM FOR ELECTRONIC DEVICE

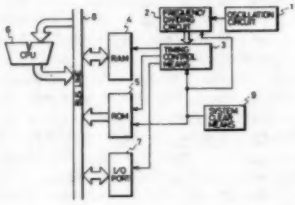
Yasushi Nakabayashi, Tokyo, Japan, assignor to Seiko Instruments Inc., Tokyo, Japan

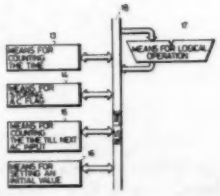
Filed Nov. 24, 1987, Ser. No. 124,877

Claims priority, application Japan, Nov. 27, 1986, 61-282289

Int. Cl.[4] H03K *21/40*

U.S. Cl. 377—28 **2 Claims**





1. An initial value setting system for an electronic device comprising:

means for generating a trigger pulse in response to each fluctuation in the voltage level of a power source for the device;

means for determining the time interval between successive ones of said trigger pulses;

means for providing a predetermined time interval including a timer responsive to a system clock;

means for storing a first indication in the presence of said trigger pulse;

means for starting said timer in response to said first indication;

means for storing a replacement indication for said first indication when said timer times out; and

means for actuating an initializing operation of the electronic device upon detection of said first indication when the time interval between successive ones of said trigger pulses is shorter than said predetermined time interval.

4,899,354

ROENTGEN LITHOGRAPHY METHOD AND APPARATUS

Albert Reinhold, Wunstorf, Fed. Rep. of Germany, assignor to Feinfocus Rontgensysteme GmbH, Wunstorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 644,212, Aug. 24, 1984. This application Jan. 14, 1987, Ser. No. 3,192

Int. Cl.[4] G21K *5/00*

U.S. Cl. 378—34 **14 Claims**

10. Roentgen lithography apparatus comprising a roentgen tube for producing long wave roentgen radiation comprising an electron gun having a glow cathode and a grid, electron beam deflecting and focusing means for producing a continuous electron beam, a stationary target on which said electron

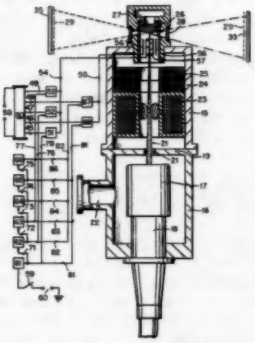
beam is directed, and a plurality of exit windows around said target through which roentgen rays produced on said target are projected,

said target having a plurality of radiation surface areas which are all of identical material and are displaced radially from a central axis of said electron gun and target, each of said radiation surface areas being positioned to direct roentgen rays solely through a respective exit windows,

said electron beam deflecting and focussing means comprising means for directing a sharply focused high intensity electron beam sequentially on said radiation surface areas with a focal spot on said target having a diameter less than 10^{-4} m. to produce roentgen radiation directed sequentially out through respective exit windows,

a plurality of substrate holders arranged around said roentgen tube for holding substrates in position to receive roentgen rays emitted through said exit windows respectively, and

a like plurality of mask holders for holding lithographic masks in front of said substrates respectively, said masks and respective substrates being illuminated sequentially by said reentgen rays,



said electron beam deflecting and focussing means operating to cause said continuous electron beam to be displaced angularly relative to said central axis and to fall successively on said radiation surface areas of said target under a target angle of from 0° to 10° with a dwell for a predetermined period of time on each radiation surface area and rapid shifting from one radiation surface area to another, the dwell time on each radiation surface area being sufficiently long to provide adequate exposure of said substrate and sufficiently short to avoid damage to said target,

said deflection and focussing means comprising first and second pairs of electron beam deflection plates disposed perpendicularly to one another about the path of said electron beam and circuitry to apply selected voltages to said deflection plate pairs,

said circuitry comprising a source of a plurality of different voltages, gate means for selectively applying selected voltages from said source to said deflection plate pairs respectively to direct said continuous electron beam to selected radiation surface areas and control circuit means including programmed timing means for controlling said gate means to rapidly shift said continuous electron beam sequentially from one to another of said radiation surface areas in predetermined repeated sequence with a predetermined dwell time on each radiation surface area.

4,899,355

X-RAY LITHOGRAPHY SYSTEM

Hans-Peter Stormberg, Stolberg, Fed. Rep. of Germany, and Yoshio Watanabe, Tokyo, Japan, assignors to U.S. Philips Corporation, New York, N.Y. and Hitachi Ltd.

Filed Jul. 5, 1988, Ser. No. 215,698

Claims priority, application Japan, Jul. 10, 1987, 62-170958

Int. Cl.[4] G21K *5/00*

U.S. Cl. 378—34 **2 Claims**

1. An X-ray lithography system comprising an X-ray source formed of a linear discharge plasma extending along a first axis, a resist film to be irradiated by the X-ray source, said resist film comprising a surface that is tilted at a predetermined angle of tilt with respect to said first axis, a band slit which is located between said X-ray source and said resist film, said slit having a long side which is parallel to a second axis that is perpendicular to said first axis, wherein the angle of tilt of said resist film surface is of sufficient magnitude that an interval of nonuniformity of said X-ray source seen from a point on said surface is smaller than the length of said X-ray source seen from said point.

4,899,356

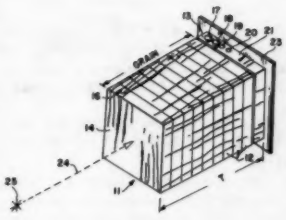
METHOD OF RADIOGRAPHIC INSPECTION OF WOODEN MEMBERS

Maggie L. Berry, and Robert F. Berry, Jr., both of Hayes, Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 25, 1987, Ser. No. 125,678

Int. Cl.[4] G01B *15/06*

U.S. Cl. 378—58 **4 Claims**



1. A non-contaminating method of radiographic inspection of a wooden specimen comprising the steps of:

introducing a non-contaminating, highly evaporative radiopaque penetrant formed of a fluorocarbon cleaning solvent into internal defects in said wooden specimen to be inspected through a surface opening therein;

subjecting the wooden specimen to a beam of radiation sufficient to pass through said wooden specimen; and

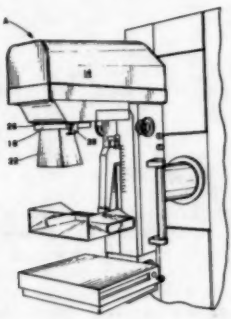
making a radiographic film image of said beam of radiation passing through said wooden specimen, said non-contaminating radiopaque penetrant in said internal defects within said specimen absorbing a portion of said beam of radiation passing therethrough, thereby enhancing the resulting film image of said internal defects without contaminating said wooden specimen.

4,899,357

X-RAY CONE SAFETY PLATE FOR X-RAY SYSTEM

Leonard F. Plut, Willowick, and William F. Nyman, Newbury, both of Ohio, assignors to Picker International Inc., Highland Hts., Ohio

Filed Sep. 9, 1988, Ser. No. 242,150
Int. Cl.[4] G21K *1/02*
U.S. Cl. 378—148 **15 Claims**



15. A method of safely removing an x-ray cone from an x-ray system, the method comprising:

providing an x-ray system having at least an x-ray tube, a housing, a flange-bearing x-ray cone, an x-ray cone holder, a release element, and a safety plate;

inserting the x-ray cone flange into the cone holder;

depressing a latch button to cause the release element to move from supporting the flange whereby the cone is released and the cone drops;

catching the dropped cone on stationary tabs which extend from the safety plate; and

removing the cone from the system by horizontally sliding its flange along the tabs.

4,899,358

CALL ANNOUNCEMENT ARRANGEMENT

James R. Blakley, Chicago, Ill., assignor to American Telephone and Telegraph Company AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 8, 1988, Ser. No. 230,224
Int. Cl.[4] H04M *1/57, 3/50*
U.S. Cl. 379—67 **26 Claims**

9. A method of processing a call from a calling communication station to a called communication station comprising

in response to said call, effecting a search for information associated with said calling station,

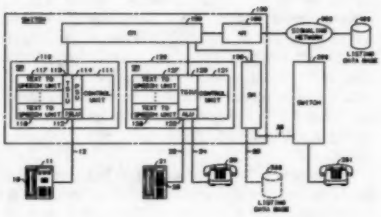
determining whether said called station is busy on another call,

upon determining that said called station is busy on another call, disconnecting a communication path between a calling communication station for said another call and said called station,

after disconnecting said communication path, transmitting speech signals, generated from information obtained during said search, to said called station,

after transmitting said speech signals to said called station, completing a communication path between said last-mentioned calling station and said called station, and

after said completing and in response to receipt of signaling from said called station, completing a communication path between said first-mentioned calling station and said called station.



21. A method of processing a call from a calling communication station to a called communication station comprising

in response to said call, effecting a search for information associated with said calling station,

transmitting speech signals, generated from information obtained during said search, to said called station, and

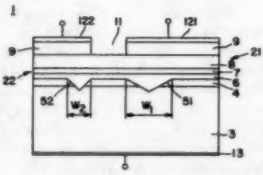
in response to disconnect signaling from said called station, transmitting call information, including said obtained information, to a message center.

4,899,359

OPTICAL MEMORY SEMICONDUCTOR LASER APPARATUS

Seiki Yano, Kashihara, and Toshiki Hijikata, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 870,511, Jun. 4, 1986, abandoned. This application Dec. 8, 1988, Ser. No. 283,013
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—44 **5 Claims**



1. An optical memory semiconductor laser apparatus incorporating a recording semiconductor laser device for an optical memory and a replaying semiconductor laser device for an optical memory, therein into a single body, wherein both said replaying semiconductor laser device and said recording semiconductor laser device are of a VSIS laser device comprising a semiconductor substrate with a V-channel that is formed through a current blocking layer, the width of the V-channel of said replaying semiconductor laser device being smaller than that of the V-channel of said recording semiconductor laser device, and the oscillation threshold current of said replaying semiconductor laser device is smaller than that of said recording semiconductor laser device.

4,899,360

SEMICONDUCTOR LASER DEVICE HAVING MONOLITHICALLY FORMED ACTIVE AND PASSIVE CAVITIES ON THE SAME SUBSTRATE

Toshihiro Fujita, Toyonaka; Jun Ohya, Neyagawa; Kenichi Matsuda, Moriguchi, and Hiroyuki Serizawa, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

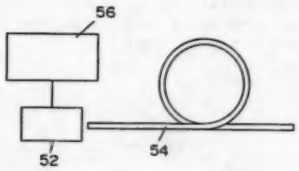
Continuation of Ser. No. 708,848, Mar. 5, 1985, Pat. No. 4,794,608. This application Nov. 8, 1988, Ser. No. 276,763

Claims priority, application Japan, Mar. 6, 1984, 59-43301; Mar. 6, 1984, 59-43302; Feb. 15, 1985, 60-28680; Feb. 18, 1985, 60-29593; Feb. 18, 1985, 60-29598; Feb. 18, 1985, 60-29607; Feb. 18, 1985, 60-29608

The portion of the term of this patent subsequent to Dec. 27, 2005, has been disclaimed.

Int. Cl.[4] H01S 3/19

U.S. Cl. 372—50 4 Claims



1. An optical signal transmission apparatus comprising:

a. a laser device including,

a semiconductor substrate,

an active cavity formed on said semiconductor substrate; and

a passive cavity formed on said semiconductor substrate, said active and passive cavities being integrally formed on said semiconductor substrate with monolithic structure and coupled in the direction of optical axes of said cavities,

said active cavity including,

an active layer for emitting light therefrom,

clad layers for confining said light into said active layer, and

electrodes for injecting current into said active layer,

said passive cavity including,

a waveguide layer for transferring therethrough the light emitted in said active cavity, and

clad layers for confining said light to said waveguide layer,

said active and passive cavities having rectangular waveguide structure to confine said light in a plane perpendicular to said direction of optical axes of said cavities,

resonator means for laser oscillation of said semiconductor laser device,

the ratio L_0/L_1 of optical length L_0 of said passive cavity to optical length L of said active cavity being set in a range of $L_0/L_1 \geq 0.5$,

b. an optical fiber coupled to said laser device, said optical fiber comprising an optical transmission source,

wherein the light emitted in said active cavity is transferred through said passive cavity and reflected and fed back to said active cavity such that the laser device comprises an optical transmission source and means for achieving analog modulation of a drive circuit.

4,899,361

OPTICAL FILTER DEVICE

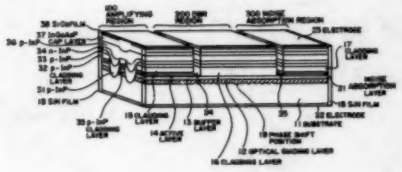
Takahiro Numai, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 13, 1988, Ser. No. 181,137

Claims priority, application Japan, Apr. 14, 1987, 62-92257

Int. Cl.[4] H01S 3/19

U.S. Cl. 372—50 4 Claims



1. An optical filter device comprising:

an amplifying region including an active layer for amplifying light of a first predetermined wavelength band;

a noise absorption region including a noise absorption layer which is transparent for light of said first predetermined wavelength band, and which absorbs light of a second predetermined wavelength band;

a distributed feedback region positioned between said amplifying and noise absorption regions, and including no active layer and no noise absorption layer;

electrodes provided on the top and back surfaces of said amplifying, noise absorption, and distributed feedback regions; and

non-reflection structures provided on both outer and facets of said amplifying and noise absorption regions;

wherein said amplifying, noise absorption, and distributed feedback regions include a common optical guiding layer; and

a bandgap energy of said noise absorption layer is smaller than that of said optical guiding layer, and is larger than that of said active layer.

4,899,362

METAL VAPOR LASER WITH IMPROVED LASER MEDIUM FORMATION

Arthur Maitland, St Andrews, and Ewan S. Livingstone, Kinrose, both of Scotland, assignors to EEV Limited, Chelmsford Essex, United Kingdom

Filed Dec. 5, 1988, Ser. No. 279,645

Claims priority, application United Kingdom, Dec. 4, 1987, 8728422; Jan. 18, 1988, 8801022; Jun. 6, 1988, 8813347

Int. Cl.[4] H01S 3/22

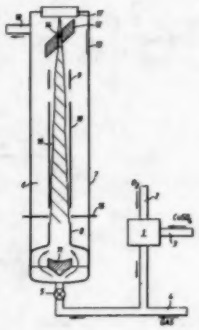
U.S. Cl. 372—55 23 Claims

1. In a laser device including a laser discharge chamber; a first electrode, a second electrode and a discharge region within said chamber, said discharge region being disposed between said electrodes, the improvement comprising:

means for generating a supply of atomized solid or liquid material, at least part of the material forming a laser amplifying medium;

means for mixing the atomized material into a gas flow

creating a gas and material mixture having droplets of the material suspended in the gas flow; and



means for introducing the mixture into said discharge region.

4,899,363

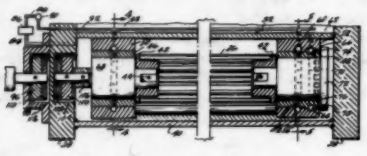
GAS BEARINGS FOR GAS LASERS

Gordon A. Murray, Carlsbad; Robert A. Golobic, and Stephan G. Derrickson, both of Colorado Springs, all of Colo., assignors to The Spectranetics Corporation, Colorado Springs, Colo.

Continuation of Ser. No. 76,906, Jul. 23, 1987, abandoned. This application May 26, 1988, Ser. No. 301,870

Int. Cl.[4] H01S *3/03*

U.S. Cl. 372—65 **16 Claims**



1. A long-life transverse electric discharge laser assembly comprising:

a housing for containing an excimer laser gas;

means for electrically exciting said laser gas within said housing;

means for circulating the laser gas within said housing; and gas bearings including

means for supporting said circulating means on a cushion of laser gas to reduce friction and to allow baking of said housing at high temperatures, which baking enables the laser to operate for extended periods.

4,899,364

AUTOMATIC GAIN CONTROL SYSTEM

Shigeo Akazawa; Masaharu Mori, and Masahiro Hamatsu, all of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Jul. 26, 1988, Ser. No. 224,576

Claims priority, application Japan, Jul. 31, 1987, 62-192219; Oct. 23, 1987, 62-267763

Int. Cl.[4] H04L *9/00*

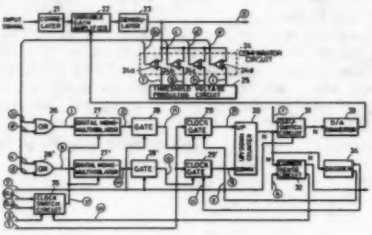
U.S. Cl. 375—1 **12 Claims**

1. An automatic gain control system in a spread spectrum receiver comprising:

correlation means for correlating a reference signal and spread spectrum signal received by the receiver;

a demodulator for demodulating data from a correlation output from said correlation means;

variable gain amplifier means provided between said correlation means and said demodulator to amplify said correlation output; and



gain control means responsive to a demodulation output from said demodulator for controlling the gain of said variable gain amplifier means.

4,899,365

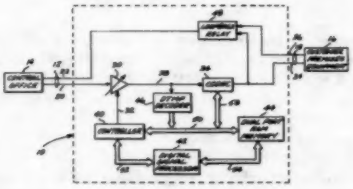
APPARATUS AND METHOD FOR ADAPTIVE AMPLITUDE EQUALIZATION

Robert G. Hove, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Feb. 29, 1988, Ser. No. 162,113

Int. Cl.[4] H04B *3/10*

U.S. Cl. 375—13 **26 Claims**



1. A circuit for connection to a signal channel for adaptively amplitude equalizing the signal channel over a predetermined channel frequency range, the circuit comprising:

means for receiving a plurality of alignment signals from the signal channel, each alignment signal being at a predetermined alignment frequency;

means for measuring the amplitude of each alignment signal and for determining filter data based upon the alignment signal amplitudes;

means for storing the filter data; and

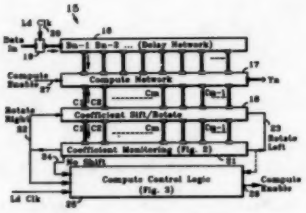
signal processor means for filtering an input signal present on the channel to produce a filtered output signal, the signal processor means including means for adjusting its amplitude response in response to the filter data stored by said means for storing, such that the combined amplitude response of the signal channel and the signal processor means is substantially flat over said channel frequency range.

4,899,366

TAP ROTATION N FRACTIONALLY SPACED EQUALIZER TO COMPENSATE FOR DRIFT DUE TO FIXED SAMPLE RATE

Gordon T. Davis, and Baiju D. Mandalia, both of Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 2, 1988, Ser. No. 227,582
Int. Cl.[4] H04B *3/06*
U.S. Cl. 375—14 **9 Claims**



1. A modem receive section comprising:

a source of fixed rate clock pulses for loading sampled signals which represent information quantized as analog amplitude signals; said information being asynchronous relative to said clock pulses;

a fractional tap spacing equalizer for processing said sampled signals in time coordination with said clock pulses; said equalizer having an optimized ensemble of coefficients positioned at a number of computing taps arranged about a reference tap and having optimized relative to said reference tap; said coefficients being used in computations involving said sampled signals; and

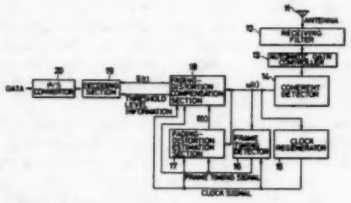
means coupled to said equalizer for correcting for misalignment of said coefficients relative to said reference tap due to relative drift between transmissions representing said analog amplitude and said fixed rate clock pulses.

4,899,367

MULTI-LEVEL QUADRATURE AMPLITUDE MODULATOR SYSTEM WITH FADING COMPENSATION MEANS

Seiichi Sampei, Akishima, Japan, assignor to Communications Research Laboratory Ministry of Posts and Telecommunications, Tokyo, Japan

Filed Feb. 2, 1989, Ser. No. 305,170
Claims priority, application Japan, Feb. 2, 1988, 63-21203
Int. Cl.[4] H04B *7/005*
U.S. Cl. 375—39 **1 Claim**



1. A multi-level quadrature amplitude modulator system comprising:

a transmitter section having a serial-to-parallel converter, baseband signal generator, transmitting filter, quadrature modulator, amplifier and antenna that is provided with: a frame symbol insertion section that inserts one known symbol per prescribed number of information symbols as a reference symbol; and

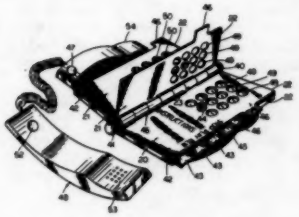
a receiving section having an antenna, receiving filter, automatic gain control, coherent detector, clock regenerator and decoding section that is provided with: a fading-distortion estimation section that estimates transmission path distortion in the information symbols from transmission path distortion that is detected on the basis of the inserted reference symbols; and a fading-distortion compensation section which uses the transmission path distortion information, as estimated by the fading-distortion estimation section, to compensate for distortion in the received baseband signal and estimates the threshold value information required for data determination by the decoding section.

4,899,368

SWITCHING MECHANISM FOR ELECTRICAL DEVICES

Lisa Krohn, 45 Gramercy Park N., New York, N.Y. 10010, and Tucker Viemeister, 74 Fifth Ave., New York, N.Y. 10011

Filed Jan. 22, 1988, Ser. No. 147,312
Int. Cl.[4] H01H *3/16*; H04M *1/21, 1/64*
U.S. Cl. 379—67 **8 Claims**



1. A switching mechanism for an electronic device having a plurality of operations comprising a plurality of actuating members each specific for the selection of an operation of the device, each operation having a plurality of functions and each connected to a switch means for selecting the operation of the device, each actuating member having the appearance of a page, and being constructed, configured and dimensioned to actuate the switch means from a non-operating to an operating condition upon the turning of each member in a manner which simulates the turning of a page of a book, each switch means being connected to and actuating a functional switch means which controls functions of operations of the device, each functional switch means being connected to and controlling a plurality of functional switch actuating means.

4,899,369

RADIO-ANALOGUE METHOD OF AUDIO PRESENTATION AND CONTROL FOR AUDIOTEX SERVICES

James M. Kondziela, Fairfield, Conn., assignor to NYNEX, New York, N.Y.

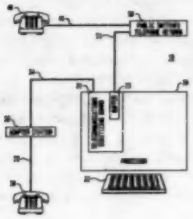
Filed May 5, 1989, Ser. No. 348,716
Int. Cl.[4] H04M *11/08*
U.S. Cl. 379—101 **29 Claims**

1. A method for presenting and controlling audiotex services comprising the steps of

in response to a telephone call received at an audiotex processor from a user, playing for the user via the public switched telephone network, an excerpt from each of a plurality of audiotex services in a sequence, and

in response to a DTMF signal generated at a telephone of

said user and received at said audiotex processor, halting the sequential playing of said excerpts and playing for said



user additional information from one of said audiotex services.

4,899,370

REMOTE CONTROL APPARATUS FOR ELECTRONIC EQUIPMENT

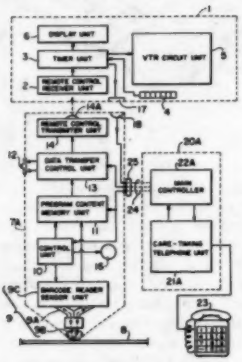
Akitaka Kameo, and Isao Kozu, both of Katano, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 13, 1988, Ser. No. 209,494

Claims priority, application Japan, Jun. 12, 1987, 62-147596; Jun. 15, 1987, 62-148566; Jun. 15, 1987, 62-148572

Int. Cl.[4] H04M *11/00*; H04N *7/10*; G06K *7/10*

U.S. Cl. 379—104 **21 Claims**



1. A remote control apparatus for controlling electronic equipment using a local telephone set and a remote telephone set, said electronic equipment having a housing and having a timer reservation unit which includes a wireless communication input unit in said housing, said timer reservation unit causing the electronic equipment to start and stop a predetermined operation at respective predetermined times in accordance with reservation information received via said input unit, said remote control apparatus comprising: a remote controller to perform wireless communication with said input unit of said timer reservation unit, said remote controller additionally being coupled to a main controller of said local telephone set, and said remote controller further including means for transmitting said reservation information to said input unit of said timer reservation unit in response to predetermined push button or dial operations of said remote telephone set, received via said main controller of said local telephone set, said means for transmitting including a remote control signal transmitter unit; and

holding means for holding said remote controller so as to maintain a predetermined mutual positional relationship between said remote controller and said electronic equipment, said holding means including

a first member capable of detachably holding said remote controller, and

a second member detachably mounted on said housing of said electronic equipment for supporting said first member such that said remote control signal transmitter unit of said remote controller faces said input unit of said electronic equipment with a predetermined clearance therebetween.

4,899,371

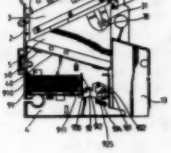
COIN SLOT STRUCTURE FOR COIN CALL TELEPHONE APPARATUS

Lih-Chuan Su, No. 1, Alley 33, Lane 788, Hsin Chuan Chih Rd., Kaohsiung, Taiwan

Filed Apr. 26, 1989, Ser. No. 343,208

Int. Cl.[4] H04M *17/02*; G07F *5/06*

U.S. Cl. 379—146 **10 Claims**



1. A coin slot structure for coin call telephone apparatus, including:

a base having a slot holder set at the upper right side for insertion therethrough of three different kinds of coins, a mandrel set at the right upper side for mounting thereon of an actuating plate, a suspension plate movably set at the right upper side through a revolving shaft, said suspension plate comprising a linking plate extending to the back side of said base to connect to a pull rod to pull a coin discharging mechanism;

a middle cover plate being fixedly mounted on said base at the right lower side to cover over half of the area;

an actuating plate including an L-shaped rod set at the right lower end to penetrate through said base, and being forced by a spring plate to constantly face toward said base with its bottom end covering over the upper part of said middle cover plate;

a bottom cover plate being set below said middle cover plate, having a right side portion to match with said base to define a coin outlet chamber and comprising an elongated convex edge set at the upper side; and

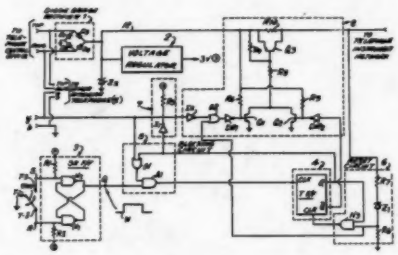
an outer cover plate having bottom ribs set at both sides to connect with said elongated convex edge of said bottom cover plate, and comprising an extension integrally set at the right upper angle through which the outer cover plate is fixedly connected with said base by a screw, said outer cover plate being arranged to space away from said actuating plate to provide a space for turning therearound of said actuating plate.

4,899,372

MULTI USE TELEPHONE EXTENSION CONTROL CIRCUIT AND DEVICE PROVIDING LOCKOUT FOR PRIVACY

Ashok L. Wahi, Somerville, N.J., and Priya Jakatdar, Branford, Conn., assignors to Better Communications, Inc., Somerville, N.J.

Filed Jan. 5, 1988, Ser. No. 141,106
Int. Cl.[4] H04M 1/70
U.S. Cl. 379—184 21 Claims



1. A control circuit for connection to the talking path of a telephone comprising

a switch (SW1, 3) for providing a pulse to a first gate (A1),

a flip/flop (4) connected to receive a pulse from said first gate and to be switched thereby to a first state with a signal on a first output (Q),

said output being connected to said first gate (A1) and enabling said gate when said flip/flop is in said first state,

a switch circuit (8) having a controlling input (DR2) connected to said flip/flop output, and a controlling path (Q3) connectible in a talking path of a telephone, said switching circuit normally providing a talking path, and interrupting said path in response to said flip/flop output,

a terminal (y) connected to said switching circuit, for rendering said switching circuit in an interrupted talking state (I2/O2/DR1 or Q1 and Q3 both off) when a signal is received thereon from outside the control circuit,

said terminal (y) also being connected to said flip/flop output (Q) and adapted to be connected to an external circuit for controlling said external circuit, and

a reset circuit (6) connected to said flip-flop (4) to switch said flip/flop into a second state in response to a signal that said telephone has gone from off-hook to on-hook.

4,899,373

METHOD AND APPARATUS FOR PROVIDING PERSONALIZED TELEPHONE SUBSCRIBER FEATURES AT REMOTE LOCATIONS

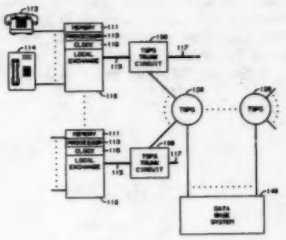
Chinmei C. Lee, Woodridge, and Stephen A. McGaw, Schaumburg, both of Ill., assignors to American Telephone and Telegraph Company AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 28, 1986, Ser. No. 935,812
Int. Cl.[4] H04M 3/44, 7/14
U.S. Cl. 379—207 17 Claims

10. A data base system for use with a telephone exchange, said telephone exchange having telephone terminals connected thereto and having assigned telephone subscribers and equipped to complete telephone calls in response to external stimuli initiated from said terminals, said data base system comprising:

storage means having a plurality of data storage areas corresponding to subscriber personal identification numbers, said storage areas for storing feature data defining presubscribed telephone features for subscribers not assigned to said telephone exchange, and

means for connecting to said telephone exchange and responsive to signals from said exchange defining a personal identification number provided to said exchange by one of said subscribers not assigned to said exchange to retrieve from an area of said storage means corresponding to said



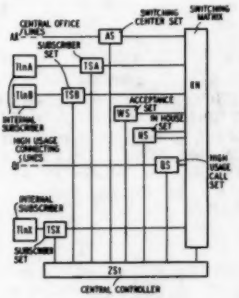
personal identification number of said one subscriber and to transmit to said exchange feature data defining presubscribed features to be used in said exchange for completing telephone calls for said one subscriber.

4,899,374

METHOD FOR A PROGRAM-CONTROLLED TELEPHONE SWITCHING SYSTEM IN WHICH PERFORMANCE FEATURES RELATING TO THE SETUP OF A CALL CONNECTION CAN BE INITIATED FROM A SUBSCRIBER STATION

Marc Van Landeghem, Deinze, Belgium, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 23, 1988, Ser. No. 235,175
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1987, 3728345
Int. Cl.[4] H04M 3/48
U.S. Cl. 379—215 3 Claims



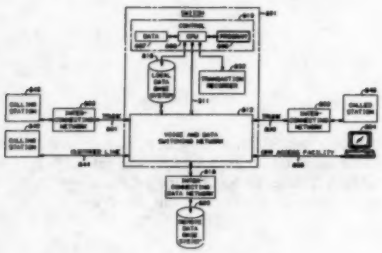
1. A method for a program-controlled telephone switching system which comprises a central controller which executes all switching functions, and said central controller has a memory in which all the information required for the execution of the switching functions are stored and where specific performance features relating to the set-up of a call connection are respectively initiatable by a subscriber station, comprising the steps of calling subscriber station calling a called subscriber station, and when the called subscriber station (T1nB) is busy, automatically initiating higher-priority performance features call-back when not busy, call waiting and cut-in in succession after prescribed timed intervals until the desired connection occurs.

4,899,375

MORE EFFICIENT CALL HANDLING FOR OPERATOR ASSISTANCE CALLS

Thomas M. Bauer, Belle Mead, N.J.; Richard W. Hemmeter, Naperville, Ill.; Robert Petrelli, Naperville, Ill.; Richard J. Piereth, Naperville, Ill., and Cyrenus M. Rubald, Naperville, Ill., assignors to American Telephone & Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J. and American Telephone & Telegraph Company, New York, N.Y.

Filed Sep. 23, 1988, Ser. No. 248,459
Int. Cl.[4] H04M *3/60*
U.S. Cl. 379—264 **27 Claims**



1. A method of setting up an operator assistance call from a calling party to a called party, comprising the steps of:

connecting said party to a first operator position;

responsive to first signals from said first operator position, disconnecting said first operator position and setting up a connection to said called party; and

responsive to receipt of an answer signal from said called party, setting up a connection between a second operator position, which may be different from said first operator position, and said called party.

4,899,376

IDENTIFICATION STRIP AND HOLDER FOR TELEPHONE CONNECTOR BLOCKS

Helmuth Neuwirth, Garden City, N.Y., assignor to Porta Systems Corp., Syosset, N.Y.

Filed Apr. 27, 1989, Ser. No. 343,679
Int. Cl.[4] H04Q *1/02*
U.S. Cl. 379—327 **6 Claims**

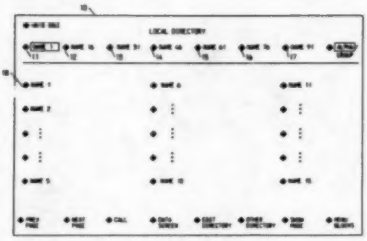
1. An improved identification marker device for use with a telephone connector block having cooperative engaging means on an exposed surface thereof for the selective reception of said marker device comprising: An elongated main body having first and second opposed planar surfaces, said first surface having retention means thereon for selectively engaging an indicia bearing member; said second surface having a plurality of laterally extending projections in mutually spaced rows thereon selectively engaging said cooperative engaging means in one of plural relative positions.

4,899,377

COMMUNICATION TERMINAL TELEPHONE DIRECTORY WITH DYNAMIC DIRECTORY TABBING

Eric J. Bauer, Matawan; Esther L. Davenport, Dunellen; Mary Kinal, North Plainfield, all of N.J., and Michael C. King, Boulder, Colo., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Information Systems Inc., Morristown, N.J.

Filed Dec. 10, 1985, Ser. No. 808,015
Int. Cl.[4] H04M *1/27*
U.S. Cl. 379—354 **9 Claims**



1. An arrangement for use in a terminal having a display, said terminal being adapted to display any one of a plurality of different screens, one of said screens being used in conjunction with a directory feature of the kin in which a list of alphabetic entries are stored in said terminal, said arrangement comprising

means for changing the composition of said list,

means responsive to a request from a user of said terminal for displaying said directory screen on said display,

means responsive to each such request for creating from the then current composition of said list a plurality of tab labels representing respective ones of said entries and for presenting on said display at least said tab labels, said tab labels being selected from said list in accordance with a predetermined selection criterion, and

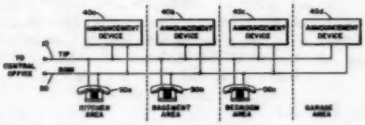
means thereafter operative in response to the selection of a particular one of said tab labels by said user for presenting on said display the respective entry and a plurality of those of said entries that immediately succeed it alphabetically.

4,899,378

TELEPHONE ANNOUNCEMENT SYSTEM

William C. Hamer, 4709 Upper Ter., Edina, Minn. 55435

Filed Jan. 27, 1988, Ser. No. 149,188
Int. Cl.[4] H04M *1/72*
U.S. Cl. 379—374 **10 Claims**



1. A self-contained telephone announcement device for transmitting baseband announcement information over only the tip and ring wires used by existing telephone equipment without modifying the connections between the telephone wires and without modifying the existing telephone equipment, comprising:

connection means for connecting to the tip and ring wires of a subscriber's telephone line in parallel to the subscriber's telephone equipment and independent of the subscriber's telephone equipment;

detector means attached to said connection means for monitoring the telephone line, for generating an ON signal in response to detecting a specific baseband DTMF tone pair on the telephone line and further for generating an OFF signal in response to detecting said baseband DTMF tone pair on the telephone line;

amplifier means attached to said connection means and said detector means for amplifying baseband audio signals placed on the telephone line by the subscriber's equipment, said amplifying being in response to said ON signal generated by said detector means; and

a speaker attached to said amplifier means such that the amplified audio signals are output through said speaker.

4,899,379

CIRCUIT ARRANGEMENT FOR THE CONNECTION OF LINE CIRCUITS OF A DIGITAL TIME MULTIPLEX-TELEPHONE NETWORK

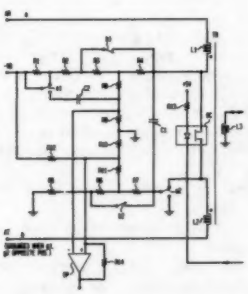
Peter Vaclavik, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 20,814, Mar. 2, 1987, abandoned. This application Jun. 12, 1989, Ser. No. 366,273

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1986, 3613715

Int. Cl.[4] H04M *3/22, 7/14*

U.S. Cl. 379—377 **2 Claims**



1. A circuit arrangement for coupling a telephone line circuit, having core conductors, to any one of: a subscriber station; dual subscriber stations of a dual service connection; and a branch exchange; said circuit arrangement comprising:

a detector circuit coupled by a voltage divider circuit to said core conductors of said telephone line circuit, to selectively provide one of: a loop closure indication of said telephone line circuit; a ground potential indication on one of said core conductors of said telephone line circuit for telephone signaling; and an off-hook indication for one of said dual subscriber stations in said dual service connection; in response to a control signal, whereby the voltage divider includes resistances of such value that alternating current noise voltages coupled into said core conductors compensate each other at the input of the detector circuit;

first switching means by which a resistance is inserted into one of said core conductors on which a ground potential indication occurs, during said ground potential indication and said off-hook indication, of such magnitude to provide a higher sensitivity of said detector circuit required for such indication and for activating at least one filter circuit to prevent the effects of the said alternating current noise voltages upon said detector circuit, and through which switching means another conductor of said core conductors of said telephone line circuit is isolated at ground potential from the detector circuit; and

second switching means for shunting said core conductors of said telephone line circuit with a low resistance.

4,899,380

LOUDSPEAKING TELEPHONE WITH A VARIABLE GAIN CIRCUIT

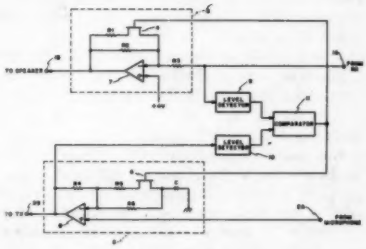
Keiko Shimada, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jul. 5, 1988, Ser. No. 215,052

Claims priority, application Japan, Jul. 6, 1987, 62-169272

Int. Cl.[4] H04M *1/60, 9/08*

U.S. Cl. 379—389 **12 Claims**



1. A loudspeaking telephone with a variable gain circuit comprising:

a receive path including first amplifying means for amplifying a receiving signal by a first gain to provide a received speech signal;

a transmit path including second amplifying means for amplifying a transmitting speech signal by a second gain to provide a transmit signal;

first means for comparing a signal level on said receive path with a signal level on said transmit path to provide a control signal to control said first and said second gains; and

second means responsive to said control signal for switching between said first and second gains to make one of said gains larger than the other of said gains, said switching occurring during a discrete change over period;

wherein the total gain obtained from said first and second gains during the changeover period of said gains is no greater than the total gain during the stable period excluding said changeover period.

4,899,381

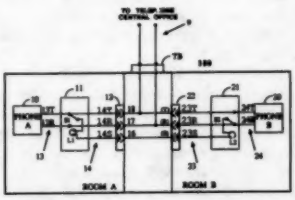
SINGLE-LINE TELEPHONE HOLD CIRCUIT

Gerritt S. K. Lee, Honolulu, Hi., assignor to GTE Hawaiian Telephone Company Incorporated, Honolulu, Hi.

Filed Apr. 7, 1989, Ser. No. 334,623

Int. Cl.[4] H04M *9/02*

U.S. Cl. 379—393 **12 Claims**



1. Auxiliary telephone apparatus for use in combination with a pair of telephones connected to a single telephone line cir-

cuit, said apparatus for placing a temporary hold on the telephone line circuit and comprising:

first interface means for operatively connecting one of said telephones to said telephone line circuit having tip and ring leads, said first interface means including:

first indicator lamp means having first and second terminals, and,

first manually actuated switching means for connecting said first terminal of said indicator lamp means to either of said tip or ring leads;

second interface means for operatively connecting the other of said telephones to said telephone line circuit, said second interface means including:

second indicator lamp means having first and second terminals, and,

second manually actuated switching means for connecting said first terminal of said second indicator lamp means to either of said tip or ring leads; and,

means for interconnecting said second terminals of said first and second indicator lamp means;

said first and second indicator lamp means having a combined internal series resistance sufficient to provide an off-hook condition on said telephone line circuit when both of said telephones are on-hook and when said first and second indicator lamp means are operatively connected across said tip and ring leads.

4,899,382

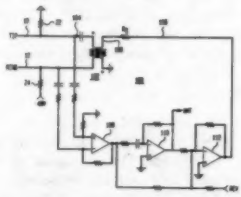
TELEPHONE CIRCUIT USING DC BLOCKED TRANSFORMER AND NEGATIVE IMPEDANCE TECHNIQUE

Todd H. Gartner, Phoenix, Ariz., assignor to Siemens Transmission Systems, Inc., Phoenix, Ariz.

Filed Jun. 15, 1988, Ser. No. 207,607

Int. Cl.[4] H04M *9/00*

U.S. Cl. 379—413 **16 Claims**



1. In a telephone subscriber line circuit for providing line current to one or more subscriber lines from a source of dc battery voltage, the improvement comprising:

line feed resistance means for coupling said battery voltage to said subscriber line;

ac input impedance synthesis circuit means, including means for sensing the voltage on said subscriber line, and a feedback loop responsive to said sensed voltage such that an effective negative impedance is provided in parallel with said line feed resistance to raise the effective input impedance of said line circuit to a value higher than the value of said line feed resistance means; and

a dc blocked transformer having a primary winding coupled to said line feed resistance means and a secondary winding coupled to said ac input impedance synthesis circuit to provide isolation from line transients.

4,899,383

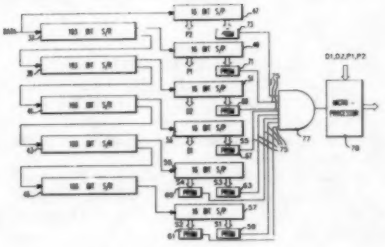
APPARATUS AND METHOD FOR SECURE DIGITAL COMMUNICATION

Charles W. Einolf, Jr., Murrysville; Harold B. Shutterly, Edgewood Boro, both of Pa.; Shan C. Sun, Coral Springs, Fla.; Russel W. Gonnam, Coral Springs, Fla.; Roger E. Ray, Coral Springs, Fla.; Karl C. Koch, Pittsburgh, and Pamela M. Maynard-Nenno, Wilkins Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 8, 1987, Ser. No. 94,186

Int. Cl.[4] H04L *7/08*

U.S. Cl. 380—48 **28 Claims**



1. A secure multichannel digital communications system comprising:

means for time multiplexing a plurality of channels to form a serial bit stream comprising successive frames with each frame containing a fixed number of bits from each of said channels, and for encoding said serial bit stream by repetitively inserting in the fixed number of bits for a selected channel in each of n successive frames, one of a sequence of separate uniquely coded signals of said fixed number of bits;

means for transmitting the encoded serial bit stream to a remote location;

means for receiving said encoded serial bit stream at the remote location;

means for continuously retaining the most recent bits of said serial bit stream received by the receiving means equal in number to the number of bits spanned by the selected channel in said n frames;

means for comparing sequential fixed number of bit length portions of the retained bit stream spaced apart by the length of a frame with stored values of said sequence of separate uniquely coded signals, and for generating a match signal when the sequential fixed number of bit length portions have a selected match with said stored values of said sequence of separate uniquely coded signals; and

means responsive to said match signal for demultiplexing said multichannel signal.

4,899,384

TABLE CONTROLLED DYNAMIC BIT ALLOCATION IN A VARIABLE RATE SUB-BAND SPEECH CODER

William G. Crouse, and Malcolm S. Ware, both of Raleigh, N.C., assignors to IBM Corporation, Armonk, N.Y.

Filed Aug. 25, 1986, Ser. No. 900,113

Int. Cl.[4] G10L *3/02*; H04B *1/66*

U.S. Cl. 381—31 **8 Claims**

1. In a sub-band speech coder system having means for sampling input speech signals, means for converting the input speech signal samples to digital sample values, means for subdividing said digital sample values into spectral frequency subbands and means for transmitting normalized and compacted values of said speech signal samples together with encoded indicia descriptive of the normalization and compaction used

to a remote receiver, an improved method of bit allocation for compacted input signal sample data comprising steps of:

sampling the input speech signals and converting the resulting samples to digital data samples;

dividing the sampled input signals into time blocks of digital data samples;

measuring the block peak energy level of said digital data samples in each said time block of digital data samples;

measuring the individual sub-band peak energy levels in each said spectral frequency sub-band in said digital data samples;

deleting a variable number of bits from each of said digital data samples in said time block in accordance with the values of said block peak energy level and of said sub-band peak energy level measurements and the spectral distribution of said sub-band peak energy levels in said time block, thereby allocating a variable total number of bits for each said time block.

4,899,385

CODE EXCITED LINEAR PREDICTIVE VOCODER

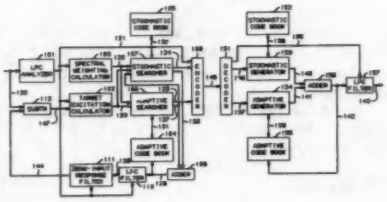
Richard H. Ketchum, Wheaton; Willem B. Kleijn, Batavia, and Daniel J. Krasinski, Glendale Heights, all of Ill., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 26, 1987, Ser. No. 67,649

Int. Cl.[4] G10L 7/02

U.S. Cl. 381—36 **18 Claims**

MICROFICHE APPENDIX INCLUDED
(1 Microfiche, 37 Pages)



1. A method of encoding speech using a plurality of candidate sets of excitation information stored in a table where said speech comprises frames of speech each frame having a plurality of samples, comprising the steps of:

storing said candidate sets of excitation information in a table in an overlapping manner whereby each candidate set differs from a previous candidate set by only a first and a second subset of excitation information where said first subset of excitation information comprises sequential samples from the beginning of each candidate set and said second subset of excitation information comprises sequential samples from the end of each candidate set;

forming a target set of excitation information in response to a present one of said frames of speech;

determining a set of filter coefficients in response to said present one of said frames of speech;

calculating information to model a finite impulse response filter from said set of filter coefficients;

recursively calculating an error value for each present one of said plurality of candidate sets of excitation information in response to the finite impulse response filter information and each of said candidate sets of excitation information and said target set of excitation information by removing a portion of the error value of said error value of said previous candidate set of excitation information contributed by said first subset of said excitation information of said previous candidate set of excitation information from said error value for said previous candidate set of excitation information to form a temporary error value and adding in a portion of error value of each present one of said candidate sets of excitation information contributed by said second subset of excitation information of each present one of said candidate sets of excitation information to said temporary error value to form an error value for each present one of said candidate sets of excitation information; and

selecting one of said candidate sets of excitation information whose calculated error value is the smallest;

determining a location in said table of said selected one of said candidate sets of excitation information;

communicating said set of filter coefficients and information representing said location of said selected one of said candidate sets of excitation information.

4,899,386

DEVICE FOR DECIDING POLE-ZERO PARAMETERS APPROXIMATING SPECTRUM OF AN INPUT SIGNAL

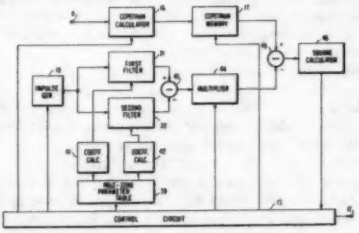
Masako Ichikawa, and Yukio Mitome, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Mar. 11, 1988, Ser. No. 167,275

Claims priority, application Japan, Mar. 11, 1987, 62-57330; Mar. 16, 1987, 62-61737; Mar. 16, 1987, 62-61738

Int. Cl.[4] G10L 5/00

U.S. Cl. 381—43 **6 Claims**



1. A pole-zero analyzer responsive to an input cepstrum related to each time window of an input signal for deciding optimum pole parameters, n in number, and optimum zero parameters, m in number, where each of n and m represents a predetermined integer, said analyzer comprising:

pole-zero memory means for memorizing a plurality of candidate pole and zero parameters in memorized set pairs, each memorized set pair consisting of a pole parameter set of n candidate pole parameters and a zero parameter set of m candidate zero parameters, said pole-zero memory means producing one of said memorized set pairs at a time as a candidate set pair;

first signal producing means responsive to the pole parameter set of said candidate set pair for producing a first output signal;

second signal producing means responsive to the zero parameter set of said candidate set pair for producing a second output signal;

converting means for converting said first and said second output signals to a converted signal which is equivalent to a model output cepstrum of a model output signal produced by a pole-zero model defined by said candidate set pair;

a subtracter for calculating a difference between said input cepstrum and said converted signal to produce a difference signal representative of said difference; and

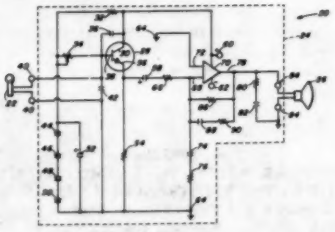
selecting means responsive to said difference signal for selecting one of said memorized set pairs as a selected set pair consisting of said optimum pole parameters and said optimum zero parameters.

4,899,387

ACTIVE LOW FREQUENCY ACOUSTIC RESONANCE SUPPRESSOR

Nelson S. Pass, Auburn, Calif., assignor to Threshold Corporation, Auburn, Calif.

Filed Dec. 2, 1988, Ser. No. 279,406
Int. Cl.[4] G10K 11/16
U.S. Cl. 381—71 10 Claims



1. An active acoustic system for low frequency resonance attenuation for an enclosed volume, such as a room, the system comprising:

an elongated housing having opposed ends;

a speaker being mounted in the housing and having a cone with an axial base with speaker drive provided to the base for generating outbound sound waves from the housing into the enclosed volume;

input means having first and second signal terminals and being located forward of the cone, for sensing incoming sound waves that form an increased pressure zone with pressure above ambient pressure and for generating an electrical input signal in response to the increased sound pressure in the increased pressure zone;

signal processing means, for receiving the electrical input signal, for generating an inverse signal relative to the input signal, and for communicating the inverse signal to the cone, thereby producing outbound sound waves that offset the increased pressure in the increased pressure zone; and

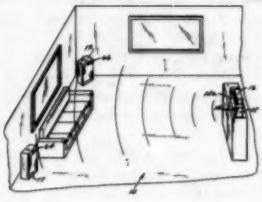
feedback means within said signal processing means adjusting the level of the inverse signal to a desired level, where the feedback means has a feedback impedance that is finite and positive for dc signals and that decreases in magnitude with increasing input signal frequency.

4,899,388

INFRARED STEREO SPEAKER SYSTEM

Allan G. Mlodzikowski, Milwaukee, Wis.; Yih-Pyng Tsui, and Hai-Pin Ku, both of Taipei, Taiwan, assignors to Koss Corporation, Milwaukee, Wis.

Filed Jan. 13, 1988, Ser. No. 143,588
Int. Cl.[4] H04B 9/00; H04H 5/00
U.S. Cl. 381—77 8 Claims



1. A stereophonic audio system, comprising:

source means for providing a source of analog electric signals containing stereophonic signal information, including an analog left channel signal and an analog right channel signal;

converting means for receiving said analog electric signals, for converting said analog electric signals to a single analog infrared signal containing both of said channel signals, and for radiating said single analog infrared signal throughout a signal area;

first electronic selecting means for disposition within said signal area for receiving said single analog infrared signal, for selecting one portion of said single analog infrared signal, for converting said one portion of said single analog infrared signal to a first audible sound signal corresponding to said right channel signal, and for radiating said audible sound signal throughout a listening area; and

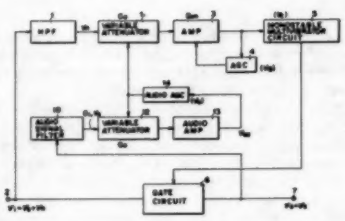
second electronic selecting means for disposition within said signal area but remote from said first selecting means for receiving said single analog infrared signal, for selecting another portion of said single analog infrared signal corresponding to said left channel signal, for converting said another portion of said single analog infrared signal to a second audible sound signal, and for radiating said second audible sound signal throughout said listening area.

4,899,389

PULSATING NOISE REMOVAL DEVICE

Kiyoshi Amazawa, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Feb. 16, 1988, Ser. No. 156,362
Claims priority, application Japan, Feb. 17, 1987, 62-34341; Feb. 17, 1987, 62-34342
Int. Cl.[4] H04B 1/10, 1/64
U.S. Cl. 381—94 9 Claims



1. A pulsating noise removal device comprising:

noise detection means for extracting noise signal components in an entered signal;

gate means for swithcing the entered signal;

audio signal detection means for extracting audio signal components in the gated entered signal;

first level changing means for varying the signal level of the extracted noise signal component;

second level changing means for varying the signal level of the extracted audio signal component;

level control means responsive to the audio signal component varied by said second level changing means to control said first and second level changing means; and

gate control means responsive to the noise signal component varied by said first level changing means to control the switching action of said gate means.

4,899,390

THIN SPEAKER HAVING AN ENCLOSURE WITHIN AN OPEN PORTION AND A CLOSED PORTION

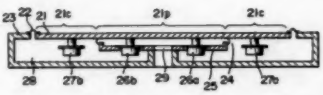
Hiroyuki Takewa, Kaizuka; Mitsuhiko Serikawa; Seiichi Ishikawa, both of Hirakata; Sawako Usuki, Kobe; Yoichi Kimura, Ashiya, and Shuichi Obata, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Tokyo, Japan

Filed Sep. 15, 1987, Ser. No. 96,528

Claims priority, application Japan, Sep. 19, 1986, 61-223149; Oct. 20, 1986, 61-248726; Nov. 27, 1986, 61-282501; Dec. 19, 1986, 61-304326; Apr. 1, 1987, 62-80015; Apr. 20, 1987, 62-96502

Int. Cl.[4] H04R 7/06, 1/24

U.S. Cl. 381—154 18 Claims



1. A speaker of the direct radiator-type comprising:

an enclosure having a first and second openings, said enclosure additionally having length, width, and thickness dimensions, with the thickness dimension being substantially smaller than the length dimension and the width dimension;

a diaphragm connected to said enclosure at said first opening;

at least one voice coil unit connected to said diaphragm; and

means for partitioning said enclosure to provide a closed enclosure portion and an open enclosure portion which communicates with said second opening, part of said diaphragm being exposed to said closed enclosure portion and another part of said diaphragm being exposed to said open enclosure portion.

wherein said enclosure includes a rear plate, said second opening being located in said rear plate of said enclosure, wherein said means for partitioning includes means connected to said rear plate for providing a tunnel to said second opening, and wherein, when said speaker is mounted adjacent a wall so that said rear plate is spaced apart from said wall by a gap, an acoustic duct is formed which extends through said tunnel and said gap.

4,899,391

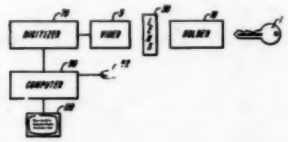
AUTOMATIC KEY IDENTIFICATION SYSTEM

William J. Cimino, 325 Rice Ave., Revere, Mass. 02151, and Robert E. Powers, Jr., 188 Faywood Ave., E. Boston, Mass. 02128

Filed Jun. 24, 1988, Ser. No. 212,342

Int. Cl.[4] G06K 9/00

U.S. Cl. 382—1 18 Claims



1. A system for identifying and matching key blanks when duplicating an original key, comprising:

a holding device into which the original key is inserted;

a lensing subsystem adjacent to said holding device which illuminates and forms an image of the front profile of said original key;

a video subsystem adjacent to said lensing subsystem which converts said image into an electrical signal;

a digitizer connected to said video subsystem which converts said electrical signal into a digital image;

a computer subsystem, having memory, connected to said digitizer which stores said digital image into said memory, processes said stored image, compares said stored image to stored images of known key blanks, identifies the proper key blank to be used in duplicating said original key, and outputs said identification data; and

an output subsystem which signals said identification data.

4,899,392

METHOD AND SYSTEM FOR OBJECTIVELY GRADING AND IDENTIFYING COINS

Henry A. Merton, Saratoga Springs, N.Y., assignor to Cing Corporation, Saratoga Springs, N.Y.

Filed Dec. 3, 1987, Ser. No. 128,494

Int. Cl.[4] G06K 9/00

U.S. Cl. 382—1 57 Claims

1. An automated method for objectively assigning a numismatic grade to a test coin of particular issue, said method comprising the steps of:

(a) electronically identifying and locating each detracting mark on one of the obverse and reverse sides of the test coin;

(b) electronically measuring the surface area of each identified detracting mark;

(c) utilizing computer means to automatically assign to each identified detracting mark a quantity proportional to the detracting significance thereof based upon the location and measured surface area of the mark on said one side of the test coin;

(d) automatically summing said assigned quantities using said computer means to arrive at an amount representative of all identified detracting marks on said one side of the test coin;

(e) automatically correlating said summed amount into a numismatic grade for said one side of the test coin with reference to a preexisting computer database of scaled values representative of numismatic grades; and

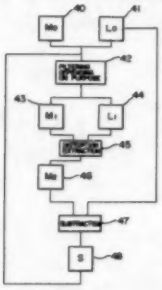
(f) repeating steps (a)–(e) for the opposite side of the test coin.

4,899,393

METHOD FOR IMAGE REGISTRATION

Koichi Morishita, Kawasaki; Tetsuo Yokoyama, Tokyo, and Kazuhiro Sato, Kitaooma, all of Japan, assignors to Hitachi, Ltd. and Hitachi Medical Corporation, both of Tokyo, Japan

Filed Feb. 10, 1987, Ser. No. 13,072
Claims priority, application Japan, Feb. 12, 1986, 61-26705
Int. Cl.[4] G06K 9/00
U.S. Cl. 382—6 3 Claims



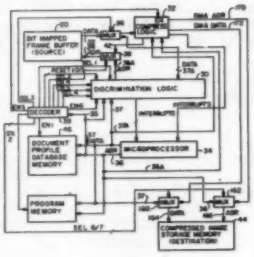
1. A method for image registration comprising the steps of:
taking first and second images of a certain region of a test object under different conditions;
adaptively selecting high frequency component emphasis coefficients corresponding to the image gray value of a desired portion to be registered in said certain region;
performing a high frequency emphasis filtering processing for the entire region of said first and second images using the adaptively selected emphasis coefficient;
defining a desired portion of said first and second images after the filtering processing; and
performing image registration between the images of the defined desired portion.

4,899,394

APPARATUS AND METHOD FOR IMAGE COMPRESSION

Jeffery H. Lee, Cupertino, Calif., assignor to Prodigy Systems Corporation, Mountain View, Calif.

Filed May 9, 1986, Ser. No. 861,510
Int. Cl.[4] G06K 9/18
U.S. Cl. 382—9 3 Claims

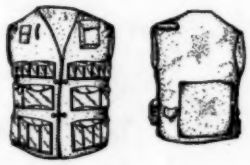


1. An apparatus for comprising a bit mapped image stored at a first resolution to a compressed image which has zones stored at said first resolution and zones stored at a second resolution comprising:
means for profiling digital data representing said bit mapped image to determine where probable zones of text are located by determining the smallest space of a selected color and examining other spaces of the same color to determine whether the sizes of these other spaces is an integer multiple of said smallest space of said selected color and for determining where probable zones of graphics are located by examining patterns of blank spaces in the image; and
means coupled to said means for profiling for compressing said zones of text at said second resolution and for converting said compressed zones to text to compressed data and for storing said compressed data along with said bit mapped data representing said zones of graphics as said compressed image.

DESIGNS

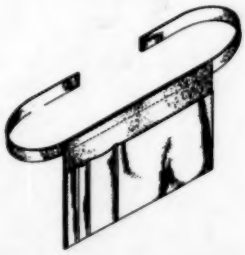
FEBRUARY 6, 1990

305,825
FISHERMAN'S VEST
Frederick A. Tenore, 6267 Kelez Ct., San Jose, Calif. 95120
Filed Sep. 15, 1986, Ser. No. 907,534
Term of patent 14 years
U.S. Cl. D2—187



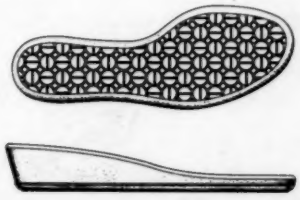
305,826
BODY SHIRT
Stanmore G. Langford, III, 1431 E. 4th St., National City, Calif. 92050
Filed Mar. 28, 1988, Ser. No. 174,339
Term of patent 14 years
U.S. Cl. D2—211

305,827
POCKETTED APRON
Joyce D. Flowers, 6330 Beechwood St., Philadelphia, Pa. 19138
Filed Jul. 6, 1989, Ser. No. 375,854
Term of patent 14 years
U.S. Cl. D2—229

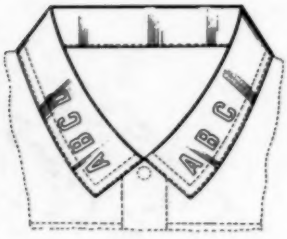


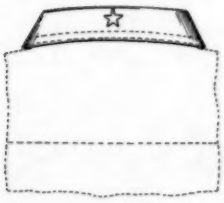
305,828
SPORT SHOE UPPER
Ian H. Whatley, Nashville, Tenn., assignor to Genesco Inc., Nashville, Tenn.
Filed Feb. 11, 1988, Ser. No. 155,015
Term of patent 14 years
U.S. Cl. D2—314

305,829
SHOE SOLE
Dominick Violi, Jr., Windham, N.H., assignor to Lowell Shoe, Inc., Hudson, N.H.
Filed Jul. 6, 1987, Ser. No. 72,571
Term of patent 14 years
U.S. Cl. D2—320

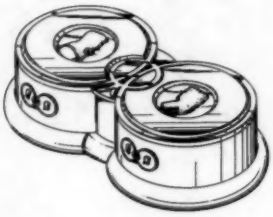


305,830
COLLAR FOR SHIRTS AND THE LIKE
Aldo Ciavatta, Superstrada Consolare San Marino 76, Rimini (Forli), Italy
Filed Sep. 3, 1986, Ser. No. 903,580
Claims priority, application Italy, May 30, 1986, 22050/86[U]; May 30, 1986, 22051/86[U]
Term of patent 14 years
U.S. Cl. D2—602



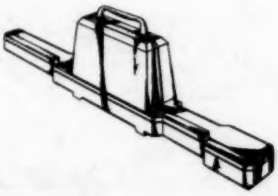


305,832
DUAL JEWELRY BOX
Gary L. Pence, 1008 Hwy. 98 E., Apt. 53, Destin, Fla. 32541
Filed Oct. 3, 1986, Ser. No. 915,332
Term of patent 14 years
U.S. Cl. D3—75

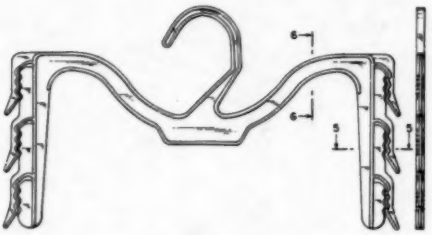


305,833
COMBINED EASEL AND CARRIER FOR ARTISTS' CANVASSES OR THE LIKE
Thomas Koves, P.O. Box 1387, Anahuac, Tex. 77514
Filed Apr. 25, 1986, Ser. No. 857,589
Term of patent 14 years
U.S. Cl. D6—312

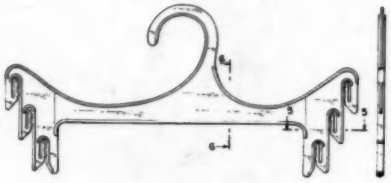
305,831
SKI EQUIPMENT CARRIER
Paul J. Vanderhorst, 1817 Enid Dr., Lithonia, Ga. 30058
Filed Aug. 15, 1986, Ser. No. 896,830
Term of patent 14 years
U.S. Cl. D3—36

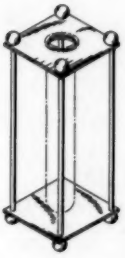


305,834
GARMENT HANGER
Joseph DeVito, Hauppauge, N.Y., assignor to Plasti-form Enterprises, Inc., Deer Park, N.Y.
Filed Oct. 5, 1988, Ser. No. 253,736
Term of patent 14 years
U.S. Cl. D6—326

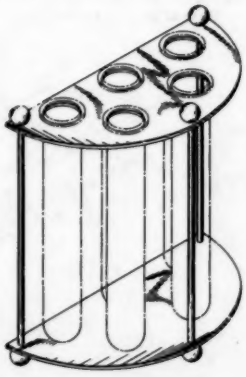


305,835
GARMENT HANGER
Joseph DeVito, Hauppauge, N.Y., assignor to Plasti-form Enterprises, Inc., Deer Park, N.Y.
Filed Oct. 5, 1988, Ser. No. 253,735
Term of patent 14 years
U.S. Cl. D6—326

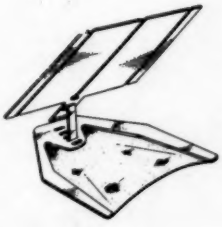




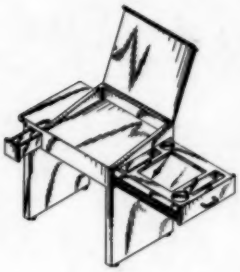
305,836
STAND FOR FLORAL CONTAINER OR THE LIKE
Ronaldo Maia, New York, N.Y., assignor to Ronaldo Maia Ltd., New York, N.Y.
Filed Dec. 30, 1987, Ser. No. 140,257
Term of patent 14 years
U.S. Cl. D6—405



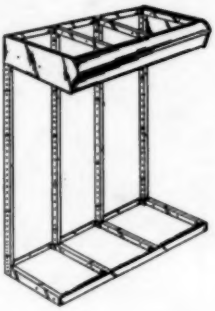
305,837
BOOK HOLDER
William R. Bowman, P.O. Box 612104, South Lake Tahoe, Calif. 95761
Filed Feb. 2, 1987, Ser. No. 10,288
Term of patent 14 years
U.S. Cl. D6—419

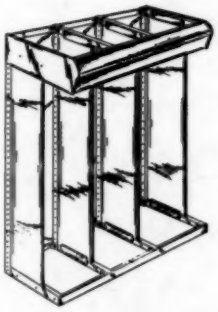


305,838
DESK OR SIMILAR ARTICLE
Berta Bienenstock, Rockaway Park, N.Y., assignor to Maneuverability, Inc., Brooklyn, N.Y.
Filed Mar. 20, 1987, Ser. No. 28,532
Term of patent 14 years
U.S. Cl. D6—420

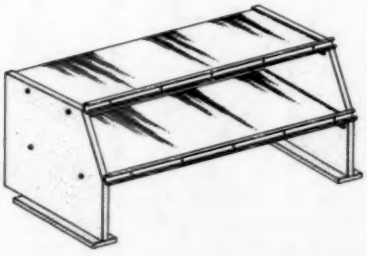


305,839
MERCHANDISING DISPLAY FRAME
Fred Howard, New York, and Sydney Edson, East Meadow, both of N.Y., assignors to Sara Lee Corporation, Winston-Salem, N.C.
Filed Apr. 17, 1987, Ser. No. 39,378
Term of patent 14 years
U.S. Cl. D6—462

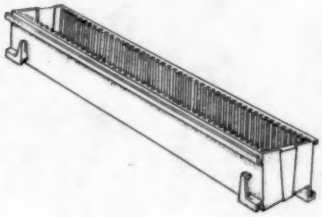




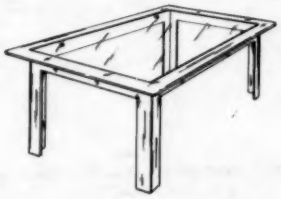
305,840
SHELF UNIT
Edward J. Mepham, 1502 Huron, Royal Oak, Mich. 48073
Filed May 8, 1987, Ser. No. 47,062
Term of patent 14 years
U.S. Cl. D6—474



305,841
DISPLAY TRAY FOR PACKAGES OF TOOTHBRUSH
Roderick I. MacQueen, Brookvale, Australia, assignor to Exhibition Displays Pty. Limited, New South Wales, Australia
Filed Apr. 10, 1986, Ser. No. 851,410
Claims priority, application Australia, Jan. 26, 1986, 3932/86
Term of patent 14 years
U.S. Cl. D6—475



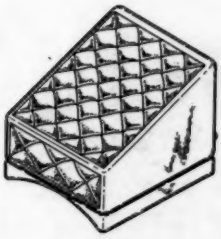
305,842
TABLE OR SIMILAR ARTICLE
Theodore W. Herr, 1960 N. Lincoln Park W., Chicago, Ill. 60614
Filed Jan. 15, 1987, Ser. No. 6,601
Term of patent 14 years
U.S. Cl. D6—480



305,843
ADJUSTABLE SEAT AND BACKREST UNIT FOR A SWIVEL CHAIR
Ola Haukvik, Stathelle, and Martin Lunde, Stranda, both of Norway, assignors to J. E. Ekornes A/S, Ikornnes, Norway
Division of Ser. No. 857,574, Apr. 25, 1986. This application Mar. 18, 1988, Ser. No. 197,001
Term of patent 14 years
U.S. Cl. D6—502

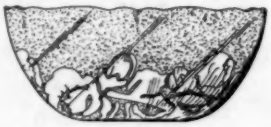
305,844
BLANKET WITH POCKET
Wei-wen Chang, P.O. Box 10780, Taipei, Taiwan
Filed Dec. 12, 1986, Ser. No. 941,928
Term of patent 14 years
U.S. Cl. D6—598

305,845
INFLATABLE CUSHION
Roger V. Foster, 6631 Buena Vista St., San Antonio, Tex. 78227
Filed Oct. 2, 1986, Ser. No. 914,758
Term of patent 14 years
U.S. Cl. D6—601

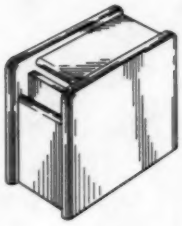


305,846
CEREAL BOWL WITH INSERT
Walter L. Griffith, 51 E. Cavalier Rd., Scottsville, N.Y. 14546
Filed Dec. 18, 1986, Ser. No. 943,301
Term of patent 14 years
U.S. Cl. D7—555

305,847
BOWL OR SIMILAR ARTICLE
Jean-Jacques Durand, LaBute, 62510 Arques, France
Filed Jul. 2, 1987, Ser. No. 69,583
Term of patent 14 years
U.S. Cl. D7—564



305,848
DRINKING STRAW DISPENSING CONTAINER
Ellen M. Marqua, and John T. Marqua, both of Rockford, Ill., assignors to Expressions in Wood, Inc., Rockford, Ill.
Filed Apr. 13, 1987, Ser. No. 37,576
Term of patent 14 years
U.S. Cl. D7—635

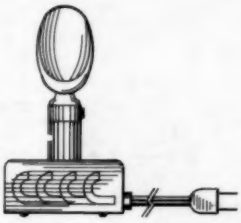


305,849
INSULATING CONTAINER FOR WATER, BEVERAGES, AND SOUPS
Ajit K. Das, 3213 S. Pacific Ave., Santa Ana, Calif. 92704; Edward Bobowski, Addison, Ill., and Tsuneo Nakazato, Tokyo, Japan, assignors to Ajit K. Das, Santa Ana, Calif.
Filed Dec. 4, 1987, Ser. No. 129,072
Term of patent 14 years
U.S. Cl. D7—606

305,850
COMBINATION COOLER, STOOL AND TABLE
Warren J. Peterson, Crestwood, and Thomas M. Carroll, St. Louis, both of Mo., assignors to River City Drum, Inc., St. Louis, Mo.
Filed Apr. 10, 1987, Ser. No. 36,694
Term of patent 14 years
U.S. Cl. D7—608

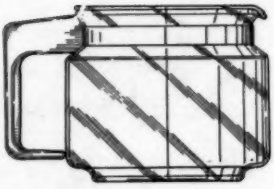
305,851
COOLER BOX
Arthur R. Carlson, Rowville, Australia, assignor to The Decor Corporation Proprietary Limited, Scoresby, Australia
Filed Apr. 11, 1986, Ser. No. 851,433
The portion of the term of this patent subsequent to Jun. 2, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—605

305,852
BATTERY HEATED ICE CREAM SCOOP
Richard N. Clement, and Theresa M. Karczmarczyk, both of Arthur St., Ludlow, Mass. 01056
Filed Sep. 28, 1987, Ser. No. 102,594
Term of patent 14 years
U.S. Cl. D7—681

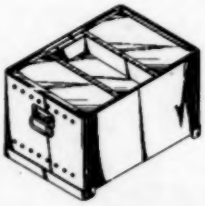


305,853
INSULATED JUG
Anso Zimmermann, Niederaula, Fed. Rep. of Germany, assignor to Rotpunkt Dr. Anso Zimmermann, Niederaula, Fed. Rep. of Germany
Filed Dec. 9, 1986, Ser. No. 939,761
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1986, MR244
Term of patent 14 years
U.S. Cl. D7—317

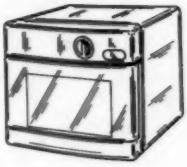
305,854
CARAFE
Thomas J. Ryan, San Diego, Calif., and Jeffrey W. DeLong, Chillicothe, Ohio, assignors to Proctor-Silex, Inc., Glen Allen, Va.
Filed May 15, 1986, Ser. No. 863,679
Term of patent 14 years
U.S. Cl. D7—319



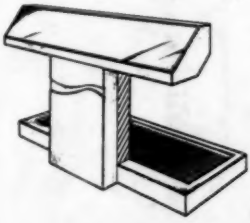
305,855
NACHOS VENDING UNIT
Howard R. Mandat, 5217 Pensacola, Garland, Tex. 75043
Filed Mar. 9, 1987, Ser. No. 23,130
Term of patent 14 years
U.S. Cl. D7—323



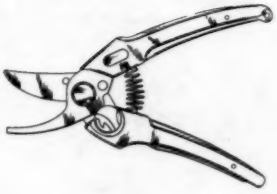
305,856
MICROWAVE OVEN
Wataru Iwahashi, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Dec. 9, 1987, Ser. No. 130,729
Claims priority, application Japan, Jun. 9, 1987, 62-23712
The portion of the term of this patent subsequent to Jan. 23, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—351



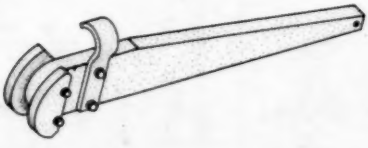
305,857
TOWER FOR A BEVERAGE DISPENSER
Alvin H. Schechter, New York, N.Y., and Carl R. Thompson, Stratford, Conn., assignors to The Coca-Cola Company, Atlanta, Ga.
Division of Ser. No. 841,749, Mar. 5, 1986. This application Nov. 3, 1988, Ser. No. 266,967
Term of patent 14 years
U.S. Cl. D7—397



305,858
PRUNING SHEARS
Kimikazu Ishida, and Tsuneo Ishida, both of Miki, Japan, assignors to Saboten Co., Ltd., Hyogo, Japan
Filed Apr. 5, 1988, Ser. No. 178,076
Claims priority, application Japan, Feb. 4, 1988, 63-4348
Term of patent 14 years
U.S. Cl. D8—5



305,859
HOOK USED IN MOORING A BOAT OR SIMILAR ARTICLE
Lewis P. White, 3436 Brookwood Rd., Birmingham, Ala. 35223
Filed Feb. 17, 1987, Ser. No. 15,723
Term of patent 14 years
U.S. Cl. D8—14



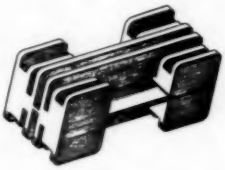
305,860
WIRE GRIPPER
Robert V. DeFrance, Poughkeepsie, N.Y., assignor to Fargo Manufacturing Company, Inc., Poughkeepsie, N.Y.
Filed Feb. 27, 1986, Ser. No. 838,041
Term of patent 14 years
U.S. Cl. D8—14

305,861
LOCK WITH DIGITAL CONTROL
Jean-Jacques Kautt, Strasbourg, France, assignor to Ferco International Usine de Ferrures de Batiment, Sarrebourg, France
Filed Oct. 13, 1987, Ser. No. 107,031
Claims priority, application France, Apr. 13, 1987, 872510
Term of patent 14 years
U.S. Cl. D8—330

305,862
ESCUTCHEON
LaVerne E. Clayton, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed Mar. 22, 1988, Ser. No. 171,926
Term of patent 14 years
U.S. Cl. D8—350

305,863
BACK PLATE
Stanley T. Gresens, Chicago, and A. Denton Green, Evanston, both of Ill., assignors to Amerock Corporation, Rockford, Ill.
Filed Aug. 21, 1986, Ser. No. 898,640
Term of patent 14 years
U.S. Cl. D8—352

305,864
CONNECTOR FOR FOLDING CRATES
Jam Sun, No. 39, Lane 106, Sec. 7, Yen-Ping N. Rd., Taipei, Taiwan
Filed Jan. 12, 1987, Ser. No. 2,187
Term of patent 14 years
U.S. Cl. D8—382

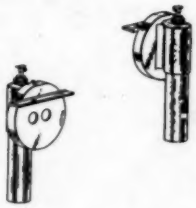


305,865
CONTAINER FOR MOIST TOWELETTES OR THE LIKE
Aaron Zutler, 19 Clearmeadow La., Woodbury, N.Y. 11797
Filed May 4, 1987, Ser. No. 45,147
Term of patent 14 years
U.S. Cl. D9—311

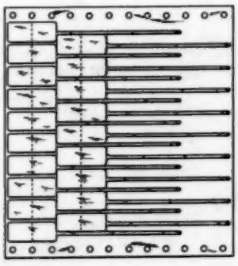
305,866
CONTAINER FOR UNDERGARMENTS
Philip Kemp, Closter, N.J., assignor to J. E. Morgan Knitting Mills, Inc., Tamaqua, Pa.
Filed Mar. 25, 1987, Ser. No. 29,880
Term of patent 14 years
U.S. Cl. D9—311

305,867
BOTTLE AND SLIDING GUIDE ASSEMBLY OR SIMILAR ARTICLE
Michel A. Moret, Geneva, Switzerland, assignor to Les Produits Associes LPA-Broxo S.A., Switzerland
Filed Dec. 3, 1986, Ser. No. 937,663
Term of patent 14 years
U.S. Cl. D9—337

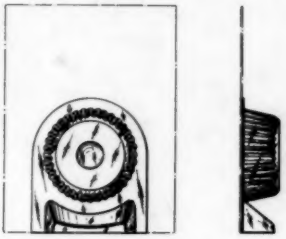
305,868
COMBINED SPRAY PUMP DISPENSER AND SQUEEGEE FOR CLEANING WINDSHIELDS
Larry O. Westall, 2815 Klondike Trail, Sioux Falls, S. Dak. 57103
Filed Oct. 13, 1987, Ser. No. 107,758
Term of patent 14 years
U.S. Cl. D9—337



305,869
PACKAGE OF SELF-ADHESIVE LABELS
Peter J. Gollon, 15 Eleanor Pl., Huntington, N.Y. 11743, and Ira Teper, 57 Columbine La., Kings Park, N.Y. 11754
Continuation-in-part of Ser. No. 686,607, Dec. 27, 1984. This application Jun. 5, 1986, Ser. No. 871,663
Term of patent 14 years
U.S. Cl. D9—341



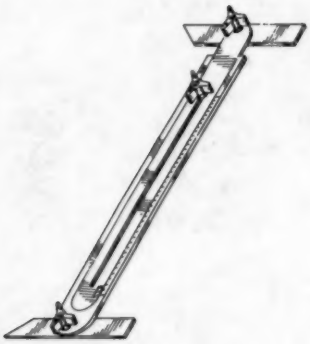
305,870
BLISTER ENCLOSURE FOR A DISPLAY PACKAGE
William H. Perkins, Oxford, Ohio, assignor to Drackett Company, Cincinnati, Ohio
Filed Mar. 30, 1987, Ser. No. 32,191
Term of patent 14 years
U.S. Cl. D9—415



305,871
BOTTLE CAP
Reinold Geiger, Neuilly, France, assignor to A.M.S., a corporation of France, Saint-Ouen-L'Aumone, France
Filed Nov. 13, 1986, Ser. No. 929,706
Claims priority, application France, May 16, 1986, 86 2629
Term of patent 14 years
U.S. Cl. D9—435

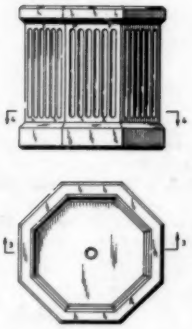
305,872
AEROSOL SPRAY HEAD
Trinidad G. Garcia, 2862 W. Imperial Hwy., Inglewood, Calif. 90303
Filed Dec. 17, 1986, Ser. No. 942,860
Term of patent 14 years
U.S. Cl. D9—448

305,873
TREAD AND RISER STAIR GAUGE
Ronald J. Bisson, RFD, Hardwick, Vt. 05836
Filed Feb. 10, 1986, Ser. No. 836,446
Term of patent 14 years
U.S. Cl. D10—62



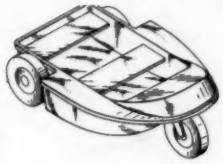
305,874
BODY JEWELRY
Linda J. Jackson, 1424 Constitution, Pueblo, Colo. 81001
Filed Jul. 20, 1987, Ser. No. 75,864
Term of patent 14 years
U.S. Cl. D11—1

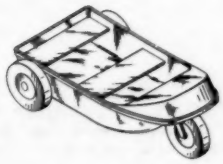
305,875
PLANT HOLDER
Kenneth P. Morritt, deceased, late of Cheltenham, Great Britain; Kenneth Morritt, executor, Cheltenham, and Robin Morritt, executor, Andoversford, both of England, assignors to Rokes Limited, Cheltenham, England
Filed Apr. 14, 1987, Ser. No. 38,531
Claims priority, application United Kingdom, Oct. 14, 1986, 1037393
Term of patent 14 years
U.S. Cl. D11—143



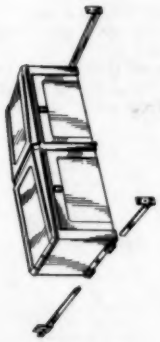
305,876
HEADSTONE FLORAL HOLDER
Marcus N. Gewinner, 207 N. Lee St., LaGrange, Ga. 30240
Filed Oct. 6, 1987, Ser. No. 105,198
Term of patent 14 years
U.S. Cl. D11—147

305,877
AMPHIBIOUS VEHICLE
Bill Price, II, P.O. Box 730, Morehead City, N.C. 28557
Filed Jul. 14, 1987, Ser. No. 72,853
Term of patent 14 years
U.S. Cl. D12—3



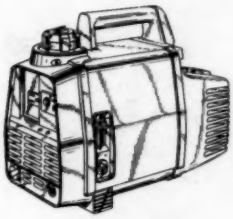


305,878
COMBINED ROLLABLE VEHICLE CABINET AND SUPPORT RAILS THEREFORE
Victor L. Schneider, 12020 Shadowbrook Dr., Olympia, Wash. 98502
Filed May 18, 1987, Ser. No. 51,039
Term of patent 14 years
U.S. Cl. D12—157

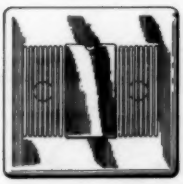


305,879
VEHICLE ROOF WIND DEFLECTOR
Bruce M. Gantner, Rochester, and Mark Gorentz, Milford, both of Mich., assignors to Webasto Sunroof Inc., Rochester Hills, Mich.
Filed Jun. 3, 1987, Ser. No. 56,980
Term of patent 14 years
U.S. Cl. D12—181

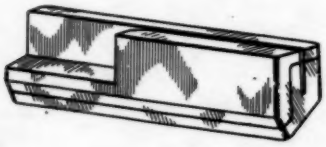
305,880
POWER GENERATOR
Jun Ito, and Takeshi Yamaguchi, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 5, 1986, Ser. No. 870,791
Term of patent 14 years
U.S. Cl. D13—2



305,881
HOUSING FOR OCCUPANCY-ACTIVATED WALL SWITCH OR THE LIKE
Gregory B. Bergeron, Montebello, Calif., assignor to NOVITAS, Santa Monica, Calif.
Filed Nov. 10, 1986, Ser. No. 929,673
Term of patent 14 years
U.S. Cl. D13—38



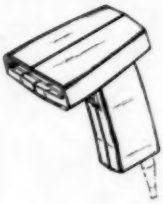
305,882
CARD READER OR SIMILAR ARTICLE
Shuzo Kato, and Yasushi Nakamura, both of Hiratsuka, Japan, assignors to NCR Corporation, Dayton, Ohio
Filed Sep. 25, 1987, Ser. No. 101,347
Claims priority, application Japan, Mar. 30, 1987, 62-11685
Term of patent 14 years
U.S. Cl. D14—105



305,883
PORTABLE COMPUTER
Michel A. Burton, Lawrenceville, Ga., assignor to Intelligent Systems Corporation, Norcross, Ga.
Filed Mar. 10, 1987, Ser. No. 24,152
Term of patent 14 years
U.S. Cl. D14—106

305,884
HAND-HELD LASER SCANNING TERMINAL
Mark Krichever, Hauppauge, and Boris Metlitsky, Stony Brook, both of N.Y., assignors to Symbol Technologies, Inc., Bohemia, N.Y.
Filed Dec. 9, 1988, Ser. No. 281,686
Term of patent 14 years
U.S. Cl. D14—116

305,885
HAND-HELD OPTICAL SCANNER
Edward D. Barkan, South Setauket; Howard M. Shepard, Great River; Frank Gong, Williston Park, and Mark J. Krichever, Hauppauge, all of N.Y., assignors to Symbol Technologies, Inc., Bohemia, N.Y.
Filed Jun. 24, 1988, Ser. No. 210,776
Term of patent 14 years
U.S. Cl. D14—116



305,886
MEMORY CARD FOR A COMPUTER SYSTEM
Toshinobu Banjo, and Shigeo Onoda, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 30, 1987, Ser. No. 79,505
Claims priority, application Japan, Mar. 20, 1987, 62-10447
Term of patent 14 years
U.S. Cl. D14—117

305,887
OPTICALLY STORED DATA CARD
Hiroshi Nishimura, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 24, 1988, Ser. No. 172,353
Claims priority, application Japan, Sep. 25, 1987, 62-39329
Term of patent 14 years
U.S. Cl. D14—117

305,888

PORTABLE RADIOTELEPHONE UNIT

Ernest M. Bevilacqua, Wilton, Conn.; Nathan Ehrlich, Morris Township, Morris County, N.J.; Anthony D. Franks, New Canaan, Conn.; Henry G. Grilk, West Milford; Wen-Jeng Li, Somerville, both of N.J., and Arthur B. Nichols, IV, New Canaan, Conn., assignors to Goldstar Products Co., Ltd., Scottsdale, Ariz.

Filed Dec. 5, 1988, Ser. No. 280,254

Term of patent 14 years

U.S. Cl. D14—138

305,889

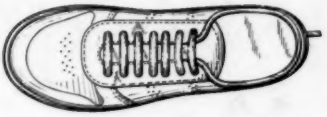
ATHLETIC SHOE TELEPHONE

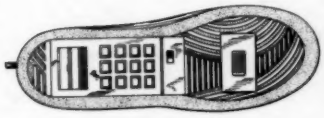
John Plunkett, Mt. Kisco, and Martin Shampaine, New York, both of N.Y., assignors to The Time Inc., Magazine Company, New York, N.Y.

Filed May 22, 1989, Ser. No. 355,541

Term of patent 14 years

U.S. Cl. D14—143





305,890

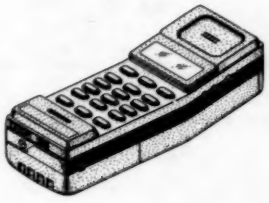
HOUSING FOR AN UPRIGHT TELEPHONE BASE

Clifford D. Read, Stittsville, Canada, assignor to Northern Telecom Limited, Montreal, Canada

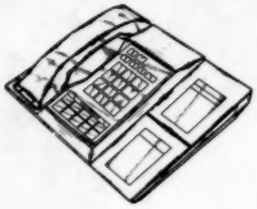
Filed Jun. 8, 1988, Ser. No. 204,488

Term of patent 14 years

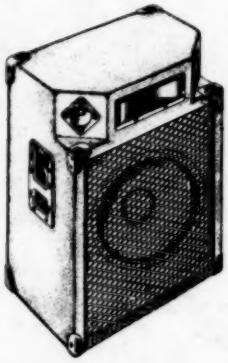
U.S. Cl. D14—146



305,891
TELEPHONE SET
David Atkins, Clifton Hill, Australia, assignor to Australian Telecommunications Corporation, Melbourne, Australia
Filed Oct. 17, 1988, Ser. No. 258,980
Claims priority, application Australia, Apr. 22, 1988, 1299/88
Term of patent 14 years
U.S. Cl. D14—151

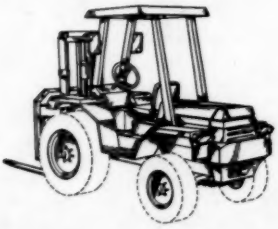


305,892
SPEAKER CABINET
Jerry F. Freed, Fort Worth, Tex., assignor to Rhythm Band, Inc., Forth Worth, Tex.
Filed May 12, 1987, Ser. No. 48,809
Term of patent 14 years
U.S. Cl. D14—213



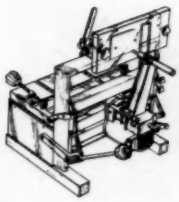
305,893
SPEAKER ENCLOSURE
Michael O. Maloney, 6301 Riggs Pl., Los Angeles, Calif. 90045
Filed Jan. 2, 1987, Ser. No. 941
Term of patent 14 years
U.S. Cl. D14—215

305,894
FORKLIFT TRACTOR
Hisato Kato; Shigeru Morita; Keiichi Sasaki, and Takashi Fukutaka, all of Sakai, Japan, assignors to Kubota, Ltd., Osaka, Japan
Filed May 5, 1986, Ser. No. 859,898
The portion of the term of this patent subsequent to Sep. 6, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D15—23

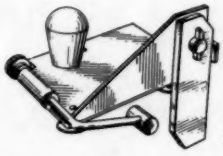


305,895
DEBARKING TOOL
Karl-Erik Jonsson, Sodra Skeppsbron 4, 802 33 Gavle, Sweden
Filed Mar. 19, 1986, Ser. No. 841,322
Term of patent 14 years
U.S. Cl. D15—29

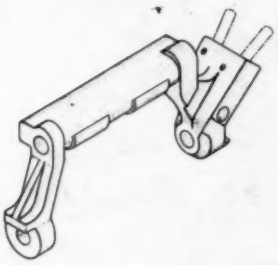
305,896
WOODWORKING ROUTER
Kouichi Miyamoto, Hiroshima, Japan, assignor to Ryobi Ltd., Hiroshima, Japan
Filed Jun. 5, 1987, Ser. No. 59,674
Claims priority, application Japan, Dec. 8, 1986, 61-48805
Term of patent 14 years
U.S. Cl. D15—127



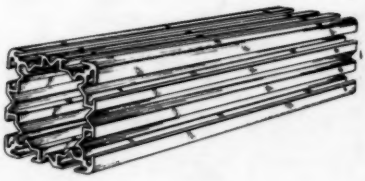
305,897
TABLE SAW STOCK FEEDER
Gordon E. Snoeyenbos, Decatur, Ill., assignor to Vega Enterprises, Inc., Decatur, Ill.
Filed Jun. 11, 1987, Ser. No. 62,041
Term of patent 14 years
U.S. Cl. D15—133



305,898
CUTTER CHAIN LINK AND TOOL HOLDER COMBINATION UNIT
John B. Whitaker, Jr., Wetumpka, and Rama N. Bail, Montgomery, both of Ala., assignors to Kershaw Manufacturing Company, Inc., Montgomery, Ala.
Filed Jun. 23, 1986, Ser. No. 877,686
Term of patent 14 years



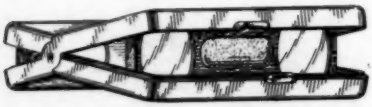
305,899
FRAME MEMBER FOR AN INDUSTRIAL PLATFORM
Kenneth Fasth, Halmstad, Sweden, assignor to Aktiebolaget Parts Invent, Halmstad, Sweden
Filed Mar. 10, 1987, Ser. No. 24,336
Claims priority, application Sweden, Sep. 12, 1986, 86 2092
Term of patent 14 years
U.S. Cl. D15—141



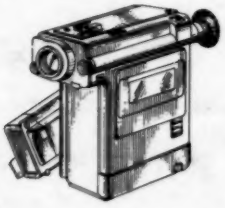
305,900
PAIR OF EYEGLASSES
Henri Samuel, Paris, France, assignor to FRED, Paris, France
Filed Feb. 11, 1987, Ser. No. 14,376
Term of patent 14 years
U.S. Cl. D16—102

305,901
GOGGLE STRAP
Wayne Witzel, 978 E. 4555 South, Salt Lake City, Utah 84117
Continuation-in-part of Ser. No. 652,130, Sep. 20, 1984, Pat. No.
Term of patent 14 years
U.S. Cl. D16—123

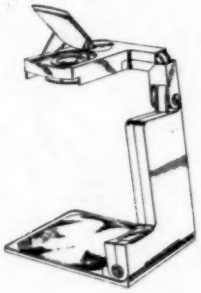
305,902
OPERA GLASSES
Shoji Wakayama, and Akio Akiyama, both of Tokyo, Japan, assignors to Young Optical Co., Ltd., Tokyo, Japan
Filed Apr. 28, 1988, Ser. No. 191,028
Term of patent 14 years
U.S. Cl. D16—133



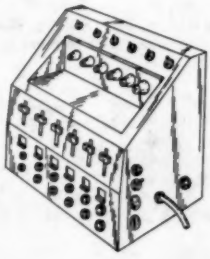
305,903
VIDEO CAMERA COMBINED WITH VIDEO TAPE RECORDER
Kaoru Sumita, Tokyo, Japan, assignor to Sony Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 22, 1986, Ser. No. 945,452
Claims priority, application Japan, Jun. 25, 1986, 61-24591
Term of patent 14 years
U.S. Cl. D16—202



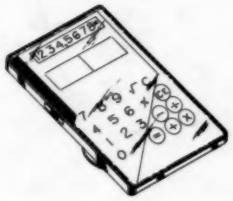
305,904
OVERHEAD PROJECTOR
Nobuki Matsumoto, Kanagawa, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed Aug. 5, 1986, Ser. No. 893,264
Claims priority, application Japan, Feb. 12, 1986, 61-004,603
Term of patent 14 years
U.S. Cl. D16—232



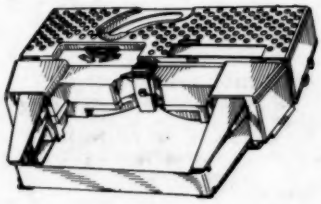
305,905
TUNER FOR A GUITAR PICKUP
John W. Hall, Rte. 1, Box 305, Dublin, Ga. 31021
Filed Jul. 24, 1986, Ser. No. 888,837
Term of patent 14 years
U.S. Cl. D17—99



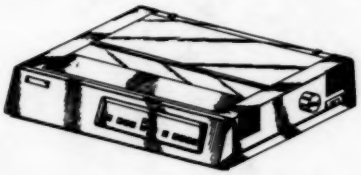
305,906
ELECTRONIC CALCULATOR WITH RADIO
Yubisui Takahisa; Hiroshi Sakaguchi, and Tadahiko Saimen, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Aug. 12, 1986, Ser. No. 895,747
Claims priority, application Japan, Feb. 13, 1986, 61-5034
Term of patent 14 years
U.S. Cl. D18—2



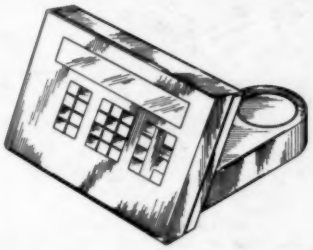
305,907
PRINTING RIBBON CARTRIDGE
Mario Bellini, Milan, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Turin, Italy
Filed Apr. 10, 1987, Ser. No. 36,700
Claims priority, application Italy, Oct. 21, 1986, 53984-8/86
Term of patent 14 years
U.S. Cl. D18—12



305,908
PRINTER FOR COMPUTER
Mitsugu Fujiwara, Morioka, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan
Filed Dec. 9, 1985, Ser. No. 807,163
Claims priority, application Japan, Jun. 12, 1985, 24628/85
Term of patent 14 years
U.S. Cl. D18—13

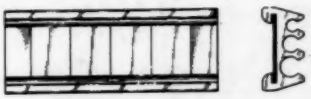


305,909
OPERATOR'S CONSOLE
Stephan Feger, Stuttgart; Walter Fischer, Böblingen; Norbert Köller, Gäufelden, and Manfred Krautwald, Sindelfingen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jan. 9, 1987, Ser. No. 1,924
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1986, MR 6113
Term of patent 14 years
U.S. Cl. D18—41

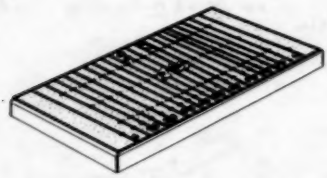


305,910
BALL-POINT PEN
Suk J. Kim, Seoul, Rep. of Korea; Atsushi Deguchi, Tokyo, and Sadao Yoshinaga, Ichikawa, both of Japan, assignors to Yoshinaga Prince Company Limited, Tokyo, Japan
Filed Feb. 26, 1987, Ser. No. 19,493
Claims priority, application Japan, Sep. 19, 1986, 61-37075
Term of patent 14 years
U.S. Cl. D19—42

305,911
TAG HOLDER FOR RECEIVING INFORMATION PIECES
Albert A. Burlando, Flanders, N.J., assignor to Almetek Industries, Incorporated, Hackettstown, N.J.
Filed May 15, 1986, Ser. No. 863,677
Term of patent 14 years
U.S. Cl. D20—44



305,912
FOOTBALL GAMEBOARD
Renald A. Poisson, 118 Alfred St., Biddeford, Me. 04005
Filed Feb. 9, 1987, Ser. No. 12,720
Term of patent 14 years
U.S. Cl. D21—29

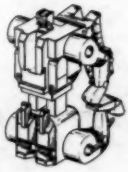


305,913
SET OF GAME STRAWS
Peter Hegedus, 5500 Ackerfield Ave., #405, Long Beach, Calif. 90805
Filed Nov. 8, 1985, Ser. No. 804,360
Term of patent 14 years
U.S. Cl. D21—51

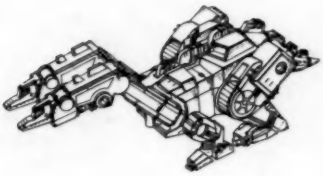
305,914
COMBINED SIMULATIVE TOY PEN BOX AND PENS
Hiroshi Ukisu, Matsudo, Japan, assignor to Epoch Company, Ltd., Tokyo, Japan
Filed Dec. 11, 1987, Ser. No. 131,535
Term of patent 14 years
U.S. Cl. D21—59

305,915
TOY ROCKING HORSE
Robb E. Hackworth, Florin Branch 8156 Florin Rd., Sacramento, Calif. 95828
Filed Sep. 3, 1987, Ser. No. 92,752
Term of patent 14 years
U.S. Cl. D21—75

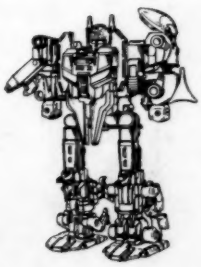
305,916
RECONFIGURABLE TOY MONSTER
Daishirou Shibukawa, Matsudo, Japan, assignor to Takara, Tokyo, Japan
Filed Feb. 6, 1987, Ser. No. 11,763
Claims priority, application Japan, Dec. 2, 1986, 61-47698
Term of patent 14 years
U.S. Cl. D21—149



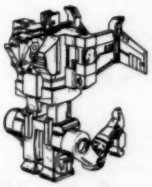
305,917
RECONFIGURABLE TOY MONSTER
Daishirou Shibukawa, Matsudo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Feb. 6, 1987, Ser. No. 11,710
Claims priority, application Japan, Dec. 2, 1986, 61-47699
Term of patent 14 years
U.S. Cl. D21—149



305,918
ROBOTIC-HUMANOID TOY ASSEMBLY
Daishirou Shibukawa, Matsudo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Feb. 6, 1987, Ser. No. 11,558
Claims priority, application Japan, Dec. 2, 1986, 61-47700
Term of patent 14 years
U.S. Cl. D21—150



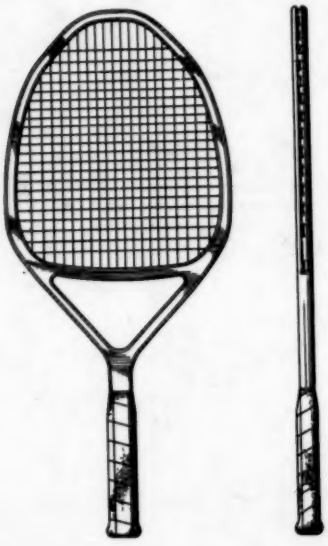
305,919
RECONFIGURABLE TOY MONSTER
Daishirou Shibukawa, Matsudo, Japan, assignor to Takara Co. Ltd., Tokyo, Japan
Filed Feb. 6, 1987, Ser. No. 11,707
Claims priority, application Japan, Dec. 2, 1986, 61-47695
Term of patent 14 years
U.S. Cl. D21—148



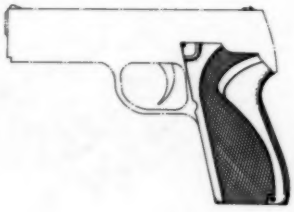
305,920
DOLL STAND
Jean Butler, 324 Whitney Ave., Trumbull, Conn. 06611
Filed May 11, 1987, Ser. No. 47,997
Term of patent 14 years
U.S. Cl. D21—189

305,921
GOLF CLUB HEAD
Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204
Filed Aug. 6, 1986, Ser. No. 893,816
Term of patent 14 years
U.S. Cl. D21—217

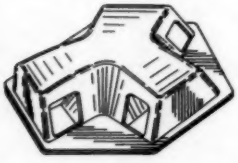
305,922
TENNIS RACQUET
Armando L. Mercado, P.O. Box 162256, Miami, Fla. 33116-2256
Filed Feb. 27, 1987, Ser. No. 19,606
Term of patent 14 years
U.S. Cl. D21—212



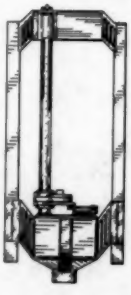
305,923
GRIP FOR HANDGUN
Robert J. Ferraro, Ludlow, Mass., and Gary A. Sniezak, Windsor, Conn., assignors to Smith & Wesson Corp., Springfield, Mass.
Filed Feb. 13, 1989, Ser. No. 309,230
Term of patent 14 years
U.S. Cl. D22—104



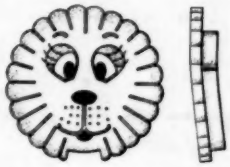
305,924
BAIT STATION
Scott W. Demarest, Racine County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Sep. 27, 1988, Ser. No. 250,033
Term of patent 14 years
U.S. Cl. D22—122



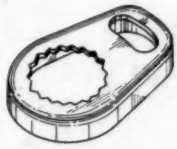
305,925
LAWN SPRINKLER
Malcolm Hastings, Coventry, and John Lang, Bicester, both of England, assignors to Hozelock-ASL Limited, Aylesbury, England
Filed Jun. 29, 1987, Ser. No. 67,474
Term of patent 14 years
U.S. Cl. D23—216



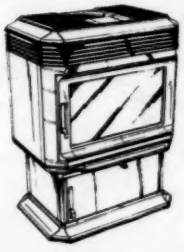
305,926
BATHROOM FIXTURE COVER
Michael J. Butler, 20566 Haynes St., Canoga Park, Calif. 91306
Filed Sep. 17, 1986, Ser. No. 908,530
Term of patent 14 years
U.S. Cl. D23—249



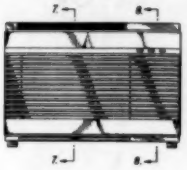
305,927
NUT LOCK PLATE
Ray D. Linderman, Streetsboro, and Peter C. Williams, Cleveland Heights, both of Ohio, assignors to Whitey Co., Highland Hts., Ohio
Filed Mar. 27, 1986, Ser. No. 847,007
Term of patent 14 years
U.S. Cl. D23—249



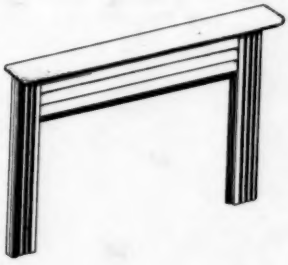
305,928
FIRE PLACE
Niels-Erik Heger, Jessheim, Norway, assignor to A/S Jotul, Oslo, Norway
Filed Aug. 30, 1988, Ser. No. 238,276
Claims priority, application Norway, Mar. 18, 1988, 69196
Term of patent 14 years
U.S. Cl. D23—350



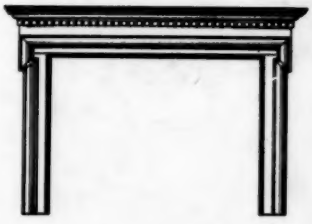
305,929
AIR CLEANER
Hideyuki Ikeda; Shinkichi Hida, and Toshinori Kitagawa, all of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 2, 1987, Ser. No. 56,682
Claims priority, application Japan, Dec. 2, 1986, 61-47637
Term of patent 14 years
U.S. Cl. D23—364



305,930
FIREPLACE MANTLE
George K. MacAleese, Huntington, Ind., assignor to Majco Building Specialties, L.P., New York, N.Y.
Filed Mar. 3, 1988, Ser. No. 163,459
Term of patent 14 years
U.S. Cl. D23—404



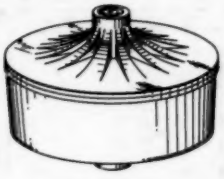
305,931
FIREPLACE MANTLE
George K. MacAleese, Huntington, Ind., assignor to Majco Building Specialties, L.P., New York, N.Y.
Filed Mar. 3, 1988, Ser. No. 163,456
Term of patent 14 years
U.S. Cl. D23—404



305,932
INDICATOR FOR A BLOOD ANALYZER
Yawara Nagai, Hachioji; Shigeru Yoshinari, Tokyo, and Masao Ushikubo, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Japan
Filed May 28, 1986, Ser. No. 868,335
Term of patent 14 years
U.S. Cl. D24—1.1

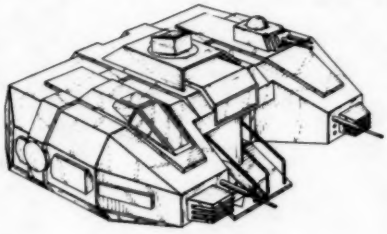
305,933
ORTHODONTIC ELASTIC APPLICATION TOOL
Richard K. Thompson, Jr., 12303 Windsor Dr., Carmel, Ind. 46032
Filed Jan. 11, 1988, Ser. No. 142,226
Term of patent 14 years
U.S. Cl. D24—10

305,934
FILTER FOR TREATING BLOOD
Yoshihisa Sone, Tokyo, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan
Filed May 21, 1987, Ser. No. 53,414
Claims priority, application Japan, Nov. 27, 1986, 61-46597
Term of patent 14 years
U.S. Cl. D24—21

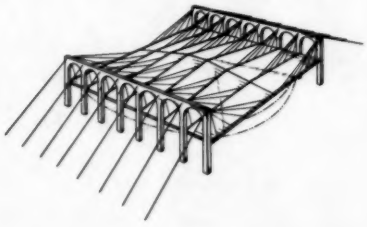


305,935
DENTAL HANDPIECE
Reinhard Strahammer, Heppenheim, and Werner Schuss, München, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Oct. 6, 1987, Ser. No. 106,432
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1987, MR10/17 183
Term of patent 14 years
U.S. Cl. D24—12

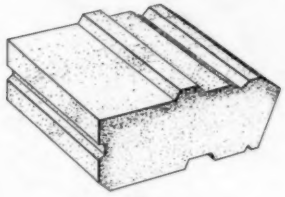
305,936
MOBILE THEATER
Lenny Sigalov, 16254 Mandalay Dr., Encino, Calif. 91436, and Timothy S. Mahoney, 5651 Eagle Court, North Vancouver, British Columbia, Canada
Filed Dec. 11, 1987, Ser. No. 132,047
Term of patent 14 years
U.S. Cl. D25—11



305,937
OPPOSED TOWER CABLE STAY SUPPORTED ROOF STRUCTURE
Adam T. Schildge, Jr., 899 Green St., San Francisco, Calif. 94133
Filed May 8, 1987, Ser. No. 47,064
Term of patent 14 years
U.S. Cl. D25—56

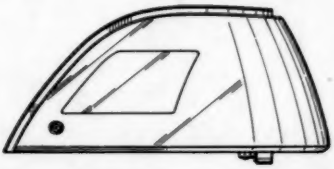


305,938
MODULAR BLOCK
Angelo Risi, and Antonio Risi, both of Richmond Hill, Canada, assignors to Rothbury Investments Limited, Gormley, Canada
Filed Jun. 16, 1989, Ser. No. 367,111
Claims priority, application Canada, Dec. 16, 1988, 16-12-88-7
Term of patent 14 years
U.S. Cl. D25—113

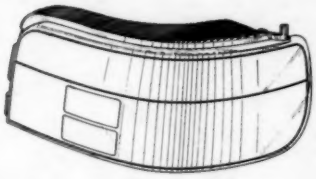


305,939
CLEARANCE LAMP FOR AN AUTOMOBILE
Hiroshi Iwagami, Yokohama, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed May 13, 1987, Ser. No. 48,918
Claims priority, application Japan, Aug. 19, 1986, 61-32176
Term of patent 14 years
U.S. Cl. D26—28

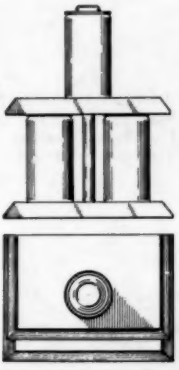
305,940
CLEARANCE LAMP FOR AN AUTOMOBILE
Kazumi Fukagawa, Tokyo, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed May 13, 1987, Ser. No. 49,090
Term of patent 14 years
U.S. Cl. D26—28



305,941
REAR COMBINATION LAMP FOR AN AUTOMOBILE
Hisao Hara, Owariasahi, and Akira Nakanishi, Kariya, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed May 13, 1987, Ser. No. 48,916
Term of patent 14 years
U.S. Cl. D26—35



305,942
LAMP BASE
Jimmy L. Reasons, Rte. 2, Box 72, Humboldt, Tenn. 38343
Filed Apr. 24, 1987, Ser. No. 42,452
Term of patent 14 years
U.S. Cl. D26—93



305,943
DIFFUSER FOR A WALL MOUNTED LIGHT FIXTURE
Andrew Ossip-Klein, 145 Georgian Ct., Rochester, N.Y. 14610
Filed Feb. 6, 1987, Ser. No. 12,116
Term of patent 14 years
U.S. Cl. D26—118

305,944
CURLING IRON HOLDER
Lela Mellott, 4560 Mellinger Rd., Canfield, Ohio 44406
Filed Feb. 12, 1987, Ser. No. 14,038
Term of patent 14 years
U.S. Cl. D28—38

305,945
COMBINED CONTAINER/BOTTLE AND COSMETIC WAND APPLICATORS OR THE LIKE
Henry J. Cassai, 163-47 85th St., Howard Beach, N.Y. 11414, and Gino H. Cassai, Brooklyn, N.Y., assignors to Henry J. Cassai, Howard Beach, N.Y.
Division of Ser. No. 765,394, Aug. 14, 1985, abandoned. This application Apr. 14, 1989, Ser. No. 337,532
Term of patent 14 years
U.S. Cl. D28—77

305,946

COMBINED CONTAINER/BOTTLE AND COSMETIC WAND APPLICATORS OR THE LIKE

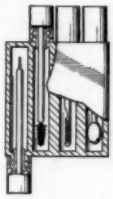
Henry J. Cassai, 163-47 85th St., Howard Beach, N.Y. 11414, and Gino H. Cassai, Brooklyn, N.Y., assignors to Henry J. Cassai, Howard Beach, N.Y.

Division of Ser. No. 790,517, Oct. 23, 1985. This application Mar. 10, 1989, Ser. No. 321,553

The portion of the term of this patent subsequent to Mar. 14, 2003, has been disclaimed.

Term of patent 14 years

U.S. Cl. D28—77



305,947

COSMETIC CASE

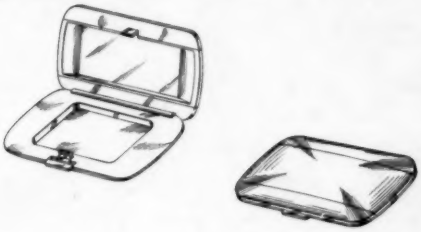
Alain Chevassus, Sceaux, France, assignor to LIR, Chevilly Larue, France

Filed Sep. 3, 1986, Ser. No. 903,438

Claims priority, application World Int. Prop. O., Mar. 3, 1986, DM/006587

Term of patent 14 years

U.S. Cl. D28—78



305,948

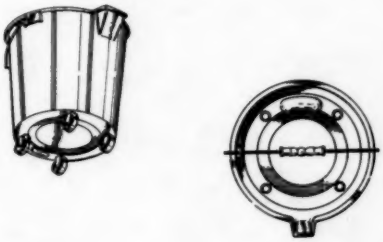
BUCKET

David L. Rentz, Wynnewood, Pa., assignor to York Plastics Corporation, Philadelphia, Pa.

Filed May 4, 1988, Ser. No. 190,222

Term of patent 14 years

U.S. Cl. D32—53



305,949

LIFT FOR MOVING A CONTAINER WITH CASTORS

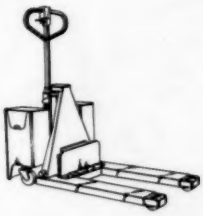
Hiroyuki Kawada, Hekinan, Japan, assignor to Sugiyasu Industries Co., Ltd., Aichi, Japan

Filed May 6, 1988, Ser. No. 190,940

Claims priority, application Japan, Mar. 20, 1988, 63-11,161

Term of patent 14 years

U.S. Cl. D34—31



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TO WHOM

PATENTS WERE ISSUED ON THE 6TH DAY OF FEBRUARY, 1990

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A/A Niro Atomizer: *See*—
Hansen, Ove E.; and Healy, Christopher P., 4,898,331, Cl. 239-223.000.

A/G Technology Corporation: *See*—
Gollan, Arye Z., 4,898,670, Cl. 210-232.000.

A. H. Robins Company, Inc.: *See*—
Walsh, David A.; and Uwaydah, Ibrahim M., 4,898,874, Cl. 514-379.000.

A. & M. Cousin Etablissements Cousin Freres: *See*—
Pipon, Yves; and Droulon, Georges, 4,898,356, Cl. 248-429.000.

A. O. Smith Corporation: *See*—
Granberg, Dirk N.; Suchomel, Frank H.; and Ryno, Robert W., 4,898,124, Cl. 122-382.000.

A.T.B. S.p.A.: *See*—
Bordignon, Abramo, 4,899,243, Cl. 360-132.000.

Aari Cine & Video Gerate Gesellschaft M.b.H.: *See*—
Hohenecker, Harald, 4,898,453, Cl. 350-255.000.

ABB CEAG Licht- und Stromversorgungstechnik GmbH: *See*—
Sommer, Friedrich-Wilhelm, 4,899,122, Cl. 336-65.000.

Abe, Yukihiro: *See*—
Kanda, Nobuo; Omura, Haruo; Abe, Yukihiro; and Kondo, Mitsuru, 4,898,941, Cl. 540-596.000.

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McDonough, Suellen, 4,898,586, Cl. 604-171.000.

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Actel Corporation: *See*—
Hamdy, Esmat Z.; Mohsen, Amr M.; and McCullum, John L., 4,899,205, Cl. 357-51.000.

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Adams, Charles R., to Aramar Inc. Trailer assembly and method. 4,898,399, Cl. 280-408.000.

Adeka Argus Chemical Co., Ltd.: *See*—
Nakahara, Yutaka; and Tobita, Etsuo, 4,898,688, Cl. 252-400.240.

Adeka Fine Chemical Co., Ltd.: *See*—
Nagai, Tomoaki; Yamanashi, Hideyuki; and Hachimori, Hideo, 4,898,902, Cl. 524-275.000.

Advanced Cardiovascular Systems, Inc.: *See*—
Badger, Rodney S.; Wasicek, Lawrence D.; and Wand, Bruce H., 4,898,577, Cl. 604-53.000.

Advanced Micro Devices, Inc.: *See*—
Berhmer, Geoffrey E.; and Peterson, Joe W., 4,899,114, Cl. 330-253.000.

Advanced Mineral Technologies, Inc.: *See*—
Brierley, James A.; Brierley, Corale L.; Decker, Raymond F.; and Goyak, George M., 4,898,827, Cl. 435-244.000.

AEG Olympia Aktiengesellschaft: *See*—
Behrens, Herbert; and Zeising, Norbert, 4,899,137, Cl. 340-711.000.

Aeroquip Corporation: *See*—
Fournier, Paul J. E.; and Reinker, Joseph F., Jr., 4,898,211, Cl. 137-615.000.
Goulette, Stephen D., 4,897,931, Cl. 33-810.000.

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Wolff, Erich; Lowski, Dieter; and Elias, Harry, 4,898,811, Cl. 430-546.000.

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AgriChem, Inc.: *See*—
Greer, David G., 4,898,092, Cl. 99-487.000.

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Isoda, Sumiro; Aibara, Shunzo; Miwa, Tamotsu; Fujiwara, Hiroyuki; Yokohama, Shuichi; and Matsumoto, Hiroo, 4,898,943, Cl. 544-251.000.

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Boucher, Stephen G., 4,898,029, Cl. 73-187.000.

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Sakakibara, Shiro; Kano, Yoshiaki; and Miyaishi, Yoshinori, 4,898,568, Cl. 474-245.000.

Aisin Seiki Kabushiki Kaisha: *See*—
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Aisin-Warner Kabushiki Kaisha: *See*—
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Numata, Koji; Asakura, Fumio; Kago, Yoshiyuki; Nozawa, Masaei; Shibakawa, Takahiro; Akado, Hajime; and Kato, Hideharu, 4,898,462, Cl. 356-70.000.

Akaki, Yuu: *See*—
Hoshino, Masahiro; Kobayashi, Isao; Seko, Kenji; Iwasawa, Naozumi; Akaki, Yuu; and Kondo, Toshio, 4,898,656, Cl. 204-181.100.

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Shiga, Syoji; Matsuda, Akira; Shibata, Nobuyuki; and Akasaka, Kiichi, 4,898,318, Cl. 228-183.000.

Akasaka, Yoichi: *See*—
Sakurai, Hiromi; and Akasaka, Yoichi, 4,899,206, Cl. 357-67.000.

Akashi, Kageyasu: *See*—
Matushita, Fumio; Akashi, Kageyasu; and Sekine, Satoshi, 4,898,843, Cl. 501-136.000.

Akatsu, Shigeyuki: *See*—
Kuroda, Michio; Sato, Isao; Ishibashi, Yoji; Uchiyama, Yoshihiro; Ohmori, Takashi; Akatsu, Shigeyuki; Kato, Fumio; Segawa, Yorihide; and Iizuka, Nobuyuki, 4,898,001, Cl. 60-733.000.

Akazawa, Shigeo; Mori, Masaharu; and Hamatsu, Masahiro, to Clarion Co., Ltd. Automatic gain control system. 4,899,364, Cl. 375-1.000.

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Kanekiyo, Takazumi; Akimoto, Yukitoshi; Kubota, Miho; Fujita, Koichi; and Koizumi, Yasunori, 4,898,685, Cl. 252-353.000.

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Fahlen, Stefan M., 4,897,894, Cl. 15-365.000.

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Wilk, Sven T.; and Olsson, John G., 4,899,131, Cl. 340-518.000.

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Daniel, Jean-Pierre L. M.; Dupuis, Phillipe; and Alanic, Jean-Luc, 4,899,163, Cl. 343-700.0MS.

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Springer, Johann; and Heck, Wolfgang, 4,899,223, Cl. 358-302.000.

Alco Chemical Corporation: *See*—
Patel, Girish K.; and Belcher, James H., 4,898,881, Cl. 514-481.000.

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Beck, Robert E., 4,897,981, Cl. 53-431.000.

Alexander, Kathryn E.: *See*—
Easter, David A.; Dick, William R.; Hackman, Donald J.; and Alexander, Kathryn E., 4,898,051, Cl. 81-57.200.

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Hoekstra, George P.; Sood, Lal C.; and Alexander, Samuel E., 4,899,317, Cl. 365-203.000.

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Hannig, Helmut, 4,898,269, Cl. 198-346.100.

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Shely, William W.; and Wells, Peter M., 4,897,899, Cl. 24-16.0PB.

Allard, Patrice: *See*—
Dodin, Andre; Siffert, Odile; Le Thuillier, Georgette; and Allard, Patrice, 4,898,815, Cl. 435-7.000.

Allart, Bernard: *See*—
Bigo, Louis; and Allart, Bernard, 4,898,076, Cl. 91-491.000.

Allebach, Gene E.: *See*—
Hite, William H.; and Allebach, Gene E., 4,898,017, Cl. 72-405.000.
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Allied-Signal, Inc.: *See*—
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Gilman, Paul S.; and Zedalis, Michael S., 4,898,612, Cl. 75-249.000.
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Conner, John P.; and Bouse, James R., 4,898,365, Cl. 256-65.000.
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Hawkins, Brian; Greenberg, Jerald; Alon, Ofer; Marten, Victor; Banyai, Edward; Edwards, Jennifer A.; Banyai, David M.; Sanchez, Juan C.; Sitnik, Eran; and Yozzo, Joseph A., 4,898,182, Cl. 128-707.000.
Alpha Industries: *See*—
Huntt, Robert L., 4,898,534, Cl. 432-250.000.
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Pruehs, Horst; Schenker, Gilbert; Altenschoepfer, Theodor; and Piorr, Robert, 4,898,621, Cl. 134-25.200.
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Ou, Jung-Hsing; and Wong, Sau-Ching, 4,899,070, Cl. 307-530.000.
So, Hock-Chuen; and Wong, Sau-Ching, 4,899,067, Cl. 307-465.000.
Altnether, Paul J.; and Strege, Timothy A., to Hunter Engineering Company. Vehicle wheel turning angle gauge. 4,897,926, Cl. 33-203.140.
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Baus, Heinz G., 4,897,889, Cl. 4-607.000.
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Alway, Robert M. Halogen absorbtion using vegetable oils and surfactants. 4,898,721, Cl. 423-240.000.
Amat-Larraz, Josquin. Urea against adenocarcinoma. 4,898,886, Cl. 514-588.000.
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Van Steenburg, Kip, 4,898,491, Cl. 403-96.000.
Amazawa, Kiyoshi, to Clarion Co., Ltd. Pulsating noise removal device. 4,899,389, Cl. 381-94.000.
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Lockwood, Arthur H.; and Gonzales, Adela, 4,898,834, Cl. 437-22.000.
Amelse, Jeffrey A.; and Reichmann, Mark G., to Amoco Corporation. Process for isomerization of unextracted, ethylbenzene-containing xylene feeds. 4,899,010, Cl. 585-480.000.
American Casting & Manufacturing Corp.: *See*—
Wenk, Joseph H. C., 4,898,412, Cl. 292-310.000.
American Cyanamid Company: *See*—
Szucs, Stephen S.; Quakenbush, Laura S.; and Marc, Pierre A., 4,898,609, Cl. 71-105.000.
Ward, John B.; Noble, Hazel M.; Porter, Neil; Fletton, Richard A.; and Noble, David, 4,898,821, Cl. 435-119.000.
American Home Products Corp.: *See*—
Hughes, Philip F.; Mobilio, Dominick; and Humber, Leslie G., 4,898,967, Cl. 560-051.000.
American Science and Engineering, Inc.: *See*—
Annis, Martin, 4,899,283, Cl. 364-413.150.
American Telephone and Telegraph Company: *See*—
Bauer, Eric J.; Davenport, Esther L.; Kinal, Mary; and King, Michael C., 4,899,377, Cl. 379-354.000.
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Grimes, Gary J.; Haas, Lawrence J.; and Sauer, Jon R., 4,898,444, Cl. 350-96.150.
Ketchum, Richard H.; Kleijn, Willem B.; and Krasinski, Daniel J., 4,899,385, Cl. 381-36.000.
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Blakley, James R., 4,899,358, Cl. 379-67.000.
Greer, Steven C., 4,899,306, Cl. 364-900.000.
Hinckley, Roger L., 4,898,446, Cl. 350-96.200.
Johnson, James M., Jr.; and Spanke, Ronald A., 4,899,335, Cl. 370-60.000.
Lee, Chinmei C.; and McGaw, Stephen A., 4,899,373, Cl. 379-207.000.
Roediger, Gary A., 4,899,333, Cl. 370-60.000.
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Halberstadt, Louis; Mertinooke, Peter E.; Perry, Joseph V.; and Muessel, Dan C., 4,898,760, Cl. 428-122.000.
Amin, Surendra A.: *See*—
Jang, Yue-Teh; Liebmann, Vern L.; Villman, Glenda S.; and Amin, Surendra A., 4,898,591, Cl. 604-282.000.
Amoco Corporation: *See*—
Amelse, Jeffrey A.; and Reichmann, Mark G., 4,899,010, Cl. 585-480.000.
Hussmann, Gregory P., 4,898,982, Cl. 568-58.000.
Lane, Kelley R., 4,899,013, Cl. 585-506.000.
Mount, Houston B., II, 4,899,219, Cl. 358-107.000.
Smith, Michael P., 4,898,831, Cl. 436-32.000.
AMP Incorporated: *See*—
Glover, Douglas W.; and Harner, Donald R., 4,898,539, Cl. 439-81.000.
Kumagai, Naoki, 4,899,029, Cl. 219-56.100.
Wu, Jeff C.; Cvijanovich, George B.; and Williams, Richard T., 4,898,650, Cl. 204-29.000.
Ampferer, Herbert, to Dr. Ing. h.c.F. Porsche AG. Cylinder head cover with suction pipe arrangement for an internal combustion engine. 4,898,125, Cl. 123-52.0MC.
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Barrow, Jeffrey G.; and Brokaw, Adrian P., 4,899,152, Cl. 341-154.000.
Anderson, Donald A. Training bat. 4,898,386, Cl. 273-26.00B.
Andors, Leonard, to Research Foundation of the State University of N.Y. Syringe having protective sleeve. 4,898,590, Cl. 604-198.000.
Angst, Christof: *See*—
Herold, Peter; and Angst, Christof, 4,898,977, Cl. 564-191.000.
Annis, Martin, to American Science and Engineering, Inc. Tomographic apparatus including means to illuminate the bounded field of view from a plurality of directions. 4,899,283, Cl. 364-413.150.
Anritsu Corporation: *See*—
Sakamoto, Takashi; and Kitagawa, Kazumaro, 4,898,463, Cl. 356-73.100.
Antal, Kalman; Rimay, Bela; and Halasz, Ferenc, to Tungsram Reszvenytarsasag. Method of and equipment for ageing a low-pressure hot-cathode discharge light source, particularly a fluorescent lamp. 4,898,554, Cl. 445-6.000.
Antiropova, Irina L.: *See*—
Alexeev, Viktor N.; Antiropova, Irina L.; and Lisenko, Artemy L., 4,898,457, Cl. 350-463.000.
Aoai, Toshiaki; Aoshima, Keitaro; and Nagashima, Akira, to Fuji Photo Film Co., Ltd. Light-sensitive o-quinone diazide composition with acidic polyurethane resin. 4,898,803, Cl. 430-191.000.
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Tsukada, Masaharu; Aoi, Shigeru; and Ashinuma, Takaaki, 4,899,291, Cl. 364-518.000.
Aoki, Kozo; and Furutachi, Nobuo, to Fuji Photo Film Co., Ltd. Silver halide color photographic material with a silver halide emulsion layer containing a cyan coupler and a color development accelerator. 4,898,812, Cl. 430-548.000.
Aoshima, Keitaro: *See*—
Aoai, Toshiaki; Aoshima, Keitaro; and Nagashima, Akira, 4,898,803, Cl. 430-191.000.
Aoyagi, Yuuji; Yokoyama, Syouji; and Yanagita, Tomohiko, to Hitachi, Ltd. Thermal transfer printer. 4,898,484, Cl. 400-120.000.
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Hollinger, Theodore G., 4,899,268, Cl. 363-4.000.
Appel, Jean, to Office National d'Etudes et de Recherche Aerospatiales. Apparatus for and method of processing signals in a composite waveform including noise and a periodic component. 4,899,289, Cl. 364-484.000.
Arai, Akihiko; Okada, Kazuichi; Kamo, Tetsuo; and Shiota, Eiji, to Matsushita Electric Industrial Co., Ltd. Suction and exhaust system of a heat cooking apparatus. 4,899,028, Cl. 219-10.493.
Arai, Shigeru: *See*—
Katsuhara, Wataru; and Arai, Shigeru, 4,899,325, Cl. 369-32.000.
Arai, Shoji: *See*—
Ogura, Eiji; Mito, Kunihiro; and Arai, Shoji, 4,898,970, Cl. 560-236.000.
Arai, Tatsuo: *See*—
Tsujimura, Osamu; Arai, Tatsuo; Nakayama, Masaaki; and Okawa, Masayuki, 4,898,499, Cl. 407-42.000.
Arai, Yasunori: *See*—
Inoue, Yoshihisa; and Arai, Yasunori, 4,899,238, Cl. 360-99.060.
Araki, Morio; Mori, Shigeto; Kaneko, Michihiro; and Go, Yasunao, to Pioneer Electronic Corporation. Touch panel control device with touch time and finger direction discrimination. 4,899,138, Cl. 340-712.000.
Araki, Yoshitami: *See*—
Motomura, Masatoshi; Muramatsu, Ichiro; Okoshi, Noboru; Araki, Yoshitami; Nomura, Kenichiro; Kozai, Takehisa; and Mita, Hiroshi, 4,898,617, Cl. 106-281.100.
Aramar Inc.: *See*—
Adams, Charles R., 4,898,399, Cl. 280-408.000.
Aratani, Matsuhiko: *See*—
Uemura, Toshinobu; Kai, Keiji; Kodani, Masateru; Yoshida, Fumiyo; and Aratani, Matsuhiko, 4,898,937, Cl. 540-227.000.
Arens, Richard F. Storage device. 4,898,284, Cl. 211-162.000.

Armco Advanced Materials Corporation: *See*—
Block, Wayne F.; Wright, Wade S.; and Klapheke, Chris G., 4,898,628, Cl. 148-111.000.
Schoen, Jerry W., 4,898,627, Cl. 148-111.000.
Shoen, Jerry W.; and Margerum, David E., 4,898,626, Cl. 148-111.000.

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Arp, George F., to John D. Brush & Co., Inc. Method and apparatus for gusseted parison draping. 4,898,707, Cl. 264-515.000.

Artwick, Kert E.; Wilkening, Steven R.; and Pallin, Leslie L., to ODL, Incorporated. Integral door light with glazing stop. 4,897,975, Cl. 52-208.000.

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Shimada, Tomoyuki; Sasaki, Masaomi; Hashimoto, Mitsuru; and Aruga, Tamotsu, 4,898,800, Cl. 430-59.000.

Asada, Kenichirou: *See*—
Shibata, Isamu; Asai, Takahiro; Nagasawa, Kiyoto; and Asada, Kenichirou, 4,899,344, Cl. 372-29.000.

Asada, Masanori; Hamaguchi, Shigeki; Katsuki, Hidetoshi; Nakamura, Yoshio; Takahashi, Hideyuki; Takahara, Kenji; Shimada, Yoshio; Ohashi, Takehisa; and Watanabe, Kiyoshi, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Process for preparing optically active indoline-2-carboxylic acid. 4,898,822, Cl. 435-121.000.

Asahi Denka Kogyo Kabushiki Kaisha: *See*—
Nagai, Tomoaki; Yamanashi, Hideyuki; and Hachimori, Hideo, 4,898,902, Cl. 524-275.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Matushita, Fumio; Akashi, Kageyasu; and Sekine, Satoshi, 4,898,843, Cl. 501-136.000.

Asahi Medical Co., Ltd.: *See*—
Takenaka, Yoshinori; Fukumi, Hirokazu; and Sekiguchi, Sadayoshi, 4,898,573, Cl. 604-6.000.

Asai Germanium Research Institute: *See*—
Nagahama, Fumio; Kakimoto, Norihiro; and Miyao, Kohei, 4,898,882, Cl. 514-492.000.

Asai, Takahiro: *See*—
Shibata, Isamu; Asai, Takahiro; Nagasawa, Kiyoto; and Asada, Kenichirou, 4,899,344, Cl. 372-29.000.

Asakura, Fumio: *See*—
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Asakura, Yukio, to Kawasaki Jukogyo Kabushiki Kaisha. Fin pad of small marine craft. 4,898,114, Cl. 114-343.000.

Asaoka, Takayoshi: *See*—
Senftoku, Hideshi; and Asaoka, Takayoshi, 4,897,984, Cl. 53-501.000.

Asars, Juris A.: *See*—
Hansen, J. Richard; Asars, Juris A.; and Oates, Robert M., 4,899,044, Cl. 250-227.000.
Leksell, David; and Asars, Juris A., 4,899,184, Cl. 346-155.000.

ASC Incorporated: *See*—
Moeller, Jon D.; and Old, Donald J., 4,898,016, Cl. 72-342.000.

Asdollahi, Norbert; Poerschke, Karl; Stark, Klaus; and Friedrich, Claus, to Wickmann-Werke GmbH. High current capacity sub-miniature fuse. 4,899,123, Cl. 337-273.000.

Asea Brown Boveri Aktiengesellschaft: *See*—
Weyland, Matthias, 4,898,025, Cl. 73-117.300.

Asea Stal AB: *See*—
Henriksson, Ragnar, 4,897,908, Cl. 29-890.440.

Ashida, Kaneyoshi, to Fischer, Harry A. Blowing agents for isocyanurate foams and method for producing the same. 4,898,893, Cl. 521-131.000.

Ashinuma, Takaaki: *See*—
Tsukada, Masaharu; Aoi, Shigeru; and Ashinuma, Takaaki, 4,899,291, Cl. 364-518.000.

Ashton, Clint H.; and Patterson, Gerald A., to Atlantic Research Corporation. Combing apparatus for braiding machine. 4,898,067, Cl. 87-8.000.

Association pour la Rationalisation et la Mecanisation de l'Exploitation Forestiere - A.R.M.E.F.: *See*—
Pomies, Jean-Pierre, 4,898,219, Cl. 144-2.00Z.

Astra Lakemedel Aktiebolag: *See*—
Bamberg, Peter; Ekstrom, Bertil A.; Forsgren, Ulf E.; and Sjoberg, Berndt O. H., 4,898,731, Cl. 424-114.000.

Astra Pharmaceutical Products, Inc.: *See*—
Bamberg, Peter; Ekstrom, Bertil A.; Forsgren, Ulf E.; and Sjoberg, Berndt O. H., 4,898,731, Cl. 424-114.000.

AT&T Bell Laboratories: *See*—
Ketchum, Richard H.; Kleijn, Willem B.; and Krasinski, Daniel J., 4,899,385, Cl. 381-36.000.

AT&T Information Systems Inc.: *See*—
Bauer, Eric J.; Davenport, Esther L.; Kinal, Mary; and King, Michael C., 4,899,377, Cl. 379-354.000.
Grimes, Gary J.; Haas, Lawrence J.; and Sauer, Jon R., 4,898,444, Cl. 350-96.150.

Atkinson, Alan W.; and Smith, David N., to T&N Materials Research Limited. Manufacture of shaped articles from refractory powder. 4,898,701, Cl. 264-109.000.

Atlantic Research Corporation: *See*—
Ashton, Clint H.; and Patterson, Gerald A., 4,898,067, Cl. 87-8.000.

Atlantic Richfield Company: *See*—
Bellew, Roy G.; Dunn, Donald P.; Stilwell, Charles T.; and Wood, Johnny D., 4,898,106, Cl. 110-346.000.
Hearn, David D.; Pasternack, Eric S.; and Segalman, Daniel J., 4,899,320, Cl. 367-35.000.
Kyle, Donald G., 4,899,144, Cl. 340-856.000.

Atochem: *See*—
Maj, Philippe; Blondel, Philippe; and Cuzin, Daniel, 4,898,896, Cl. 528-323.000.

Atsumi, Takehiko: *See*—
Shibagaki, Taro; Atsumi, Takehiko; Ibe, Hiroyuki; and Tanikoshi, Sadao, 4,899,339, Cl. 370-102.000.

Augat Inc.: *See*—
Mendenhall, David W.; and Goff, Jay T., 4,899,099, Cl. 324-158.00F.

Austoft Industries, Ltd.: *See*—
Baker, Malcolm J.; Williams, John G.; and Yates, Graham G., 4,897,986, Cl. 56-13.900.

AVCO Corporation: *See*—
Loszewski, Raymond C., 4,898,778, Cl. 428-368.000.

Avery International Corporation: *See*—
Chen, Tien-Tsung; Wegdell, C. Stefan; Rutkowski, Wayne L.; and Kao, Kim Y., 4,898,323, Cl. 229-92.300.

Avidan, Amos A.; Johnson, David L.; and Soto, Jorge L. Upgrading propene-ethene mixtures in a turbulent fluidized catalyst bed reactor. 4,899,014, Cl. 585-533.000.

Ayer, George E., to Reliance Comm/Tec Corporation. Extruded plastic hinge cover for terminal blocks. 4,898,550, Cl. 439-718.000.

Azad, Farzin H.: *See*—
Kuchar, Norman R.; and Azad, Farzin H., 4,899,347, Cl. 372-33.000.

Azuma, Masashi: *See*—
Morita, Hideki; Sugawara, Kazuhiro; Hung, Pc-Chieh; Hara, Hirotaka; Nakamura, Tadashi; Kobayashi, Kazuyuki; Azuma, Masashi; and Katsuta, Tsuyoshi, 4,899,215, Cl. 358-78.000.

B. F. Goodrich Company, The: *See*—
Lane, Parley C.; Tenney, Linwood P.; Benedikt, George M.; and Stricharczuk, Paul T., 4,899,005, Cl. 585-360.000.

Baba, Fumio; Kobayashi, Kazuya; Enomoto, Seiji; and Ogawa, Hiroaki, to Fujitsu Limited; and Fujitsu VLSI Limited. Semiconductor memory device having a register. 4,899,310, Cl. 365-189.050.

Baba, Masanao, to Nippon Cable System Inc. Control device for boat engine. 4,898,045, Cl. 74-471.00R.

Babcock, Richard L. Children's book providing a continuous roadway. 4,898,404, Cl. 281-15.100.

Bacardit, Juan S., to Bendix Espana. Variable ratio steering mechanism. 4,898,043, Cl. 74-388.0PS.

Bacon, Benjamin E., Jr. Viscous liquid dispenser. 4,898,304, Cl. 222-82.000.

Bader, Mark S., to Kohler Co. Automatic compression release apparatus for an internal combustion engine. 4,898,133, Cl. 123-182.000.

Badger, Rodney S.; Wasicek, Lawrence D.; and Wand, Bruce H., to Advanced Cardiovascular Systems, Inc. Guiding cathether with controllable distal tip. 4,898,577, Cl. 604-53.000.

Badiali, Roberto: *See*—
Colli, Luigi; Badiali, Roberto; and Marangone, Nereo, 4,899,286, Cl. 364-470.000.

Baggett, Rex A. Holder for pocket square. 4,897,900, Cl. 24-543.000.

Baggiolini, Enrico G.; Hennessy, Bernard M.; and Uskokovic, Milan R., to Hoffman-La Roche Inc. Deuterated analogs of 1,25-dihydroxycholecalciferol. 4,898,855, Cl. 514-167.000.

Baile, Gnaneshwar R.; McVannel, Donald E.; Reading, Kirsten L.; and Hall, Ginger L., to Dow Corning Corporation. Method for preparing alkenylsilanes. 4,898,961, Cl. 556-479.000.

Bailey, Denis M.; Lesher, George Y.; and D'Ambra, Thomas E., to Sterling Drug Inc. N-(heterocycle)alkyl)-1H-pyrazole-1-alkanamides as antiarrhythmic agents, compositions and use. 4,898,880, Cl. 514-406.000.

Baker, Malcolm J.; Williams, John G.; and Yates, Graham G., to Austoft Industries, Ltd. Cane harvester feed roll mounting apparatus. 4,897,986, Cl. 56-13.900.

Baker, Robert: *See*—
Rayfield, Jerry W.; Baker, Robert; and Weber, Kenneth E., 4,898,620, Cl. 106-464.000.

Balasubramanian, Neelakantan: *See*—
Wright, John J.; Sit, Sing-Yuen; Balasubramanian, Neelakantan; and Brown, Peter J., 4,898,949, Cl. 548-253.000.

Baldone, Joseph A. Treatment of virus infections with ganglionic blocking agents. 4,898,888, Cl. 514-642.000.

Balhorn, Milo G., to Masonry Processes, Inc. Method and means for texturizing objects. 4,897,969, Cl. 51-418.000.

Balzers Aktiengesellschaft: *See*—
Winkler, Otto, 4,899,078, Cl. 313-37.000.

Bamberg, Peter; Ekstrom, Bertil A.; Forsgren, Ulf E.; and Sjoberg, Berndt O. H., to Astra Lakemedel Aktiebolag; and Astra Pharmaceutical Products, Inc. Antibiotic combinations of penicillins. 4,898,731, Cl. 424-114.000.

Bammel, Brian D.; Wieczerniak, Walter J.; and Snell, Kenneth D., to OMI International Corporation. Polyoxalkylated polyhydroxy compounds as additives in zinc alloy electrolytes. 4,898,652, Cl. 204-44.200.

Bankstahl, Herbert A., to Brunswick Corporation. Marine drive unit with reduced drag. 4,898,553, Cl. 440-76.000.

Banyai, David M.: *See*—
Hawkins, Brian; Greenberg, Jerald; Alon, Ofer; Marten, Victor; Banyai, Edward; Edwards, Jennifer A.; Banyai, David M.; San-

chez, Juan C.; Sitnik, Eran; and Yozzo, Joseph A., 4,898,182, Cl. 128-707.000.

Banyai, Edward: *See—*
Hawkins, Brian; Greenberg, Jerald; Alon, Ofer; Marten, Victor; Banyai, Edward; Edwards, Jennifer A.; Banyai, David M.; Sanchez, Juan C.; Sitnik, Eran; and Yozzo, Joseph A., 4,898,182, Cl. 128-707.000.

Barbieri, Raul; and Marianelli, Giorgio. Clock with pendular element. 4,899,324, Cl. 368-76.000.

Barcia, Hugo M.: *See—*
Schneider, John L.; and Barcia, Hugo M., 4,898,244, Cl. 166-297.000.

Barenholz, Yechezkel; and Gabizon, Alberto, to Yissum Research and Development Company of the Hebrew University of Jerusalem; and Hadassah Medical Organization. Liposome/doxorubicin composition and method. 4,898,735, Cl. 424-450.000.

Barfod, Jesper M., to General Electric Company. Gamma camera with image uniformity by energy correction offsets. 4,899,054, Cl. 250-369.000.

Barish, Herman B., to Lockheed Corporation. Twist drill. 4,898,503, Cl. 408-230.000.

Barker, Richard L., to Wooster Brush Company, The. Paint roller frame including snap-on cover for outboard end cap. 4,897,893, Cl. 15-230.110.

Baron, John M.: *See—*
Potter, David; Provost, Laurence N.; Baron, John M.; Stefanovic, David; Sharakan, Eric D.; Sheppard, David A.; and Isman, Marshall A., 4,899,342, Cl. 371-10.100.

Barr, John D., to Reed Tool Company Limited. Cutting structures for rotary drill bits. 4,898,252, Cl. 175-379.000.

Barrow, Jeffrey G.; and Brokaw, Adrian P., to Analog Devices, Inc. Method and apparatus for temperature compensating a digital to analog converter. 4,899,152, Cl. 341-154.000.

Barry, Peter L.; and Vowles, Robert W., to Lacress Nominees Pty. Ltd. Cleaning of tubes using projectiles. 4,898,197, Cl. 134-8.000.

Bartholomew, Donald D., to Proprietary Technology, Inc. Method of making a fluid pressure surge damper for a fluid system. 4,897,906, Cl. 29-890.900.

Bartik, Michal: *See—*
Kasafirek, Evzen; Rybak, Miroslav; Krejci, Ivan; Sturc, Antonin; Roubalova, Alena; Vanzura, Jiri ; Krepela, Evzen; and Bartik, Michal, 4,898,930, Cl. 530-332.000.

Bartlett, Alan, to Detex Corporation. Programmable movement analyzer with a plurality of mercury switches. 4,899,133, Cl. 340-573.000.

Bartmann, Wilhelm: *See—*
Bergmann, Andreas; Bartmann, Wilhelm; Beck, Gerhard; and Lau, Hans-Hermann, 4,898,868, Cl. 514-277.000.

Barvinek, Todd A.; and Jessen, James W., to General Signals, Inc. Railroad crossing gate. 4,897,960, Cl. 49-49.000.

BASF Aktiengesellschaft: *See—*
Keil, Michael; Jahn, Dieter; Becker, Rainer; Rohr, Wolfgang; and Wuerzer, Bruno, 4,898,610, Cl. 71-121.000.
Sliwka, Wolfgang, 4,898,696, Cl. 264-4.700.
Vietmeier, Juergen; Pfoehler, Peter; Brauch, Gundo; Druschke, Wolfgang; and Zosel, Albrecht, 4,898,909, Cl. 524-820.000.

Basile, Carlo; Cavallerano, Alan P.; and Tsinberg, Mikhail, to North American Philips Corporation. Method and apparatus for recombining a main panel component with a augmentation panel component to create a wide aspect ratio televison display. 4,899,220, Cl. 358-141.000.

Bates, Keith A.; Budd, Russell A.; Habegger, Millard A.; and Rhoades, Mark L., to International Business Machines Corporation. Focus servo loop correction. 4,899,327, Cl. 369-45.000.

Battelle Memorial Institute: *See—*
Cry, John W.; Kirkham, Randy R.; McBride, John F.; Simmons, Carver S.; and Gee, Glendon W., 4,899,047, Cl. 250-227.000.
Easter, David A.; Dick, William R.; Hackman, Donald J.; and Alexander, Kathryn E., 4,898,051, Cl. 81-57.200.

Bauer, Adolf: *See—*
Urban, Franz; and Bauer, Adolf, 4,898,714, Cl. 422-133.000.

Bauer, Eric J.; Davenport, Esther L.; Kinal, Mary; and King, Michael C., to American Telephone and Telegraph Company; and AT&T Information Systems Inc. Communication terminal telephone directory with dynamic directory tabbing. 4,899,377, Cl. 379-354.000.

Bauer, Thomas M.; Hemmeter, Richard W.; Petrelli, Robert; Piereth, Richard J.; and Rubald, Cyrenus M., to American Telephone & Telegraph Company, AT&T Bell Laboratories; and American Telephone & Telegraph Company. More efficient call handling for operator assistance calls. 4,899,375, Cl. 379-264.000.

Baumberg, Iosif. Air supplying device, and method of air supply. 4,898,164, Cl. 128-202.180.

Baur, Hans; and Bittermann, Hans, to Siemens Aktiengesellschaft. Centrally controlled telecommunications exchange system. 4,899,336, Cl. 370-63.000.

Baus, Heinz G., to Altura Leiden Holding B.V. Shower-partition with pivoted door. 4,897,889, Cl. 4-607.000.

Baxter Healthcare Corporation: *See—*
Borsanyi, Alexander S.; and Redmond, Russell J., 4,898,583, Cl. 604-153.000.
Borsanyi, Alexander S.; Redmond, Russell J.; Vidal, Claude A.; and Spaeth, Edmund E., 4,898,584, Cl. 604-153.000.
Borsanyi, Alexander S.; and Jones, Michael L., 4,898,585, Cl. 604-153.000.

Baxter International Inc.: *See—*
Madsen, David C.; and Tucker, Hugh N., 4,898,879, Cl. 514-400.000.

Rubalcaba, Bernardino, Jr., 4,898,578, Cl. 604-66.000.
Zbed, Brian D., 4,898,209, Cl. 137-614.040.

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Kliger, Isaac E.; and Beckerleg, Richard A., 4,898,340, Cl. 244-3.110.

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Thorne, Glenn A.; Joy, Robert D.; and Simpson, Jeff A., 4,898,464, Cl. 356-152.000.

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Nakayashiki, Susumu; Kashio, Jiro; Harakawa, Takeshi; Bekki, Yoshinori; and Yamaga, Mitsuhiro, 4,899,142, Cl. 340-825.050.

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Gauthier, Michel; and Belanger, Andre, 4,897,917, Cl. 29-623.300.

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Perkinson, Robert H.; Stearns, Charles F.; and Belanger, Rene F., 4,898,324, Cl. 236-92.00R.

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Broersma, Lester V.; and Wurster, Fritz W., 4,897,888, Cl. 2-421.000.

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Luce, Betty M.; and Berdan, Betty L., 4,898,647, Cl. 204-13.000.

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Chen, Fu; and Carey, William S., 4,898,684, Cl. 252-181.000.

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Fitzner, Klaus; Betz, Walter; Plitt, Uwe; and Schmitt, Wolfgang, 4,898,087, Cl. 98-40.100.

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Van Wechem, Guus; Beunk, Gerrit; Van Den Elst, Frits; and Van Der Ploeg, Arie, 4,898,142, Cl. 123-557.000.

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Schultz, Gary R.; and Beverly, James A., 4,898,216, Cl. 141-4.000.

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Schonafinger, Karl; Beyerle, Rudi; and Schindler, Ursula, 4,898,866, Cl. 514-252.000.

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Pickering, J. H.; Bhatia, Sushil K.; and Chevrette, Roger, 4,898,405, Cl. 281-29.000.

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Birzer, Josef, to Siemens Aktiengesellschaft. Mounting for a control device. 4,899,252, Cl. 361-350.000.

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Baur, Hans; and Bittermann, Hans, 4,899,336, Cl. 370-63.000.

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Moe, Rolf; Correia, David J.; and Downs, Michael, 4,898,639, Cl. 156-345.000.

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Blackburn, Raymond L., to Coils, Inc. Method for making a tranformer core assembly. 4,897,916, Cl. 29-609.000.

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Maj, Philippe; Blondel, Philippe; and Cuzin, Daniel, 4,898,896, Cl. 528-323.000.

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Hille, Arvin A., 4,898,057, Cl. 83-831.000.

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Messroghli, Hossein; and Boebel, Manfred, 4,898,157, Cl. 606-147.000.

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Christensen, Stephen; and Rakel, Jay O., 4,898,754, Cl. 427-369.000.
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Herbst, David H.; and Boes, Chris E., 4,898,299, Cl. 220-90.400.

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Raasch, Hans; and Boker, Reinhard, 4,897,993, Cl. 57-302.000.

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Bonke, Carl, to Western Digital Corporation. Transient free clock switch logic. 4,899,351, Cl. 375-108.000.

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Boothroyd, Edwin J., to Westinghouse Electric Corp. Alternating current electromagnet. 4,899,121, Cl. 335-245.000.

Borden, Inc.: *See*—
Gallant, William E., 4,897,896, Cl. 17-74.000.

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Livingston, Glen L.; Borges, John; and Mina, George L., 4,898,994, Cl. 568-720.000.

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Borzo, Marie; and Stuetz, Dagobert E., to Hoechst Celanese Corporation. Organic nonlinear optical media. 4,898,691, Cl. 252-589.000.

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Norman, Daniel A.; Newton, Ronald R.; Nicholas, Glenn V.; Bellofatto, Steven; and Onody, Stephen K., 4,898,169, Cl. 606-42.000.

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Mancewicz, James M.; and Bosworth, William R., Jr., 4,898,046, Cl. 74-502.500.

Bottoms, Stanley; and Korzik, James L., to Paradyne Corp. Hybrid interface adapter. 4,898,547, Cl. 439-652.000.

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Boucher, Stephen G., to Airmar Technology Corporation. Marine instrument. 4,898,029, Cl. 73-187.000.

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Conner, John P.; and Bouse, James R., 4,898,365, Cl. 256-65.000.

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Swinderman, R. Todd; Bowman, Michael A.; and Goldbeck, Larry J., 4,898,272, Cl. 198-841.000.

Boyer, Robert. Binocular stabilizer device. 4,898,311, Cl. 224-257.000.

Braddick, Britt O., to Texas Iron Works, Inc. Retrievable well bore tubular member packer arrangement and method. 4,898,245, Cl. 166-387.000.

Brandes, Wilhelm: *See*—
Buchel, Karl H.; Holmwood, Graham; Kraatz, Udo; Kramer, Wolfgang; Reinecke, Paul; Brandes, Wilhelm; and Stendel, Wilhelm, 4,898,875, Cl. 514-383.000.

Brandstadter, Jack M. Active hydropneumatic suspension system. 4,898,257, Cl. 180-9.100.

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Vietmeier, Juergen; Pfoehler, Peter; Brauch, Gundo; Druschke, Wolfgang; and Zosel, Albrecht, 4,898,909, Cl. 524-820.000.

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Groshong, Leroy E.; Groshong, Judson C.; and Brawn, R. James, deceased, 4,898,579, Cl. 604-67.000.

Breckenfeld, Paul W.; and Broughton, George L., to Outboard Marine Corporation. Crankcase seal arrangement for two cycle engine. 4,898,134, Cl. 123-195.00R.

Brehm, Lothar, to Metallgesellschaft Aktiengesellschaft. Piston for a high-enthalpy wind tunnel. 4,898,028, Cl. 73-147.000.

Bremenour, Edwin L.: *See*—
Tratar, Michael F.; Bremenour, Edwin L.; and Terdan, Dale R., 4,898,538, Cl. 439-76.000.

Bresatac Limited: *See*—
Symons, Robert H., 4,898,951, Cl. 548-303.000.

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Epworth, Richard E.; Wright, Stephen; and Bricheno, Terry, 4,898,443, Cl. 350-96.150.

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Fukahori, Yoshihide; Kojima, Hiromu; Ogino, Akihiko; Suzuki, Shigenobu; and Yoshizawa, Toshikazu, 4,899,323, Cl. 367-176.000.

Brierley, Corale L.: *See*—
Brierley, James A.; Brierley, Corale L.; Decker, Raymond F.; and Goyak, George M., 4,898,827, Cl. 435-244.000.

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Gunn, William L.; Heath, William D., Jr.; and Mantovani, John C., 4,898,564, Cl. 433-3.000.

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Han, William T.; and Wright, John J., 4,898,950, Cl. 548-253.000.
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Wright, John J.; Sit, Sing-Yuen; Balasubramanian, Neelakantan; and Brown, Peter J., 4,898,949, Cl. 548-253.000.

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Dave , Dilip; and Hall, Antony H. P., 4,899,006, Cl. 585-415.000.

Broadhurst, Thomas E., to Exxon Research and Engineering Company. Multi-point cold solvent injection in scraped surface dewaxing chillers. 4,898,659, Cl. 208-33.000.

Brochand, Max, to Pomagalski SA. Aerial transport installation with two suspension-traction cables and pulleys displaced vertically. 4,898,100, Cl. 104-192.000.

Brockwell, Jonathan L.: *See*—
Manyik, Robert M.; Brockwell, Jonathan L.; and Kendall, John E., 4,899,003, Cl. 585-313.000.

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Brokaw, Adrian P.: *See*—
Barrow, Jeffrey G.; and Brokaw, Adrian P., 4,899,152, Cl. 341-154.000.

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Van Hoek, Hendrik C.; and Williams, Daryl N., 4,899,061, Cl. 250-560.000.

Bromine Compounds Limited: *See*—
Becker, Abram; Kornberg, Nurit; and Croitoru, Berta, 4,898,993, Cl. 568-658.000.
Peled, Michael, 4,898,900, Cl. 524-220.000.

Bronton Limited: *See*—
Magninat, Michel; and Charden, Eric, 4,898,460, Cl. 351-114.000.

Brooker, Dennis B., to Ventura Forge, Inc. Folding knife. 4,897,922, Cl. 30-166.000.

Brookmire, Michael A.: *See*—
Robbins, Daniel H.; Wirtz, John S.; Lein, Juergen; and Brookmire, Michael A., 4,899,214, Cl. 358-75.000.

Brooktree Corporation: *See*—
Colles, Joseph H., 4,899,151, Cl. 341-145.000.
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Katzenstein, Henry S., 4,899,103, Cl. 324-99.00D.
Lewyn, Lanny L., 4,899,153, Cl. 341-156.000.

Brose, Peter W., to Torrington Product Ventures, Inc. Animal training and restraining system. 4,898,120, Cl. 119-29.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Horaguchi, Yoichi; Tomizawa, Takashi; Hayashi, Shigeyuki; Ohno, Motoshi; and Nakata, Takashi, 4,899,193, Cl. 355-55.000.
Yokoi, Takeshi; Nakamura, Shigeo; and Yamanaka, Hiroshi, 4,898,488, Cl. 400-642.000.

Broughton, George L.: *See*—
Breckenfeld, Paul W.; and Broughton, George L., 4,898,134, Cl. 123-195.00R.

Brown, Arthur K., Jr., to Allied-Signal, Inc. Adaptive braking system having hydraulic booster and pump-back system. 4,898,432, Cl. 303-114.000.

Brown, Bernard T.; Donnelly, Donald E.; and Toth, Bartholomew L., to Emerson Electric Co. Thermostat with integral means for detecting out-of-phase connection of a two-transformer power source. 4,898,229, Cl. 165-11.100.

Brown, Frederick J.; and Yee, Ying K., to ICI Americas Inc. Heterocyclic carboxamides. 4,898,863, Cl. 514-235.200.

Brown, Josephine S.; and Sipinen, Alan J., to Minnesota Mining and Manufacturing Company. Easy tear sterilization indicator tape. 4,898,762, Cl. 428-152.000.

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Brown, Richard R.: *See*—
Klas, Kenneth H.; and Brown, Richard R., 4,897,942, Cl. 37-244.000.

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Johnson, Robert R.; and Riehl, Tilford F., 4,898,191, Cl. 131-359.000.

Brownlee, Merrel, to Alliance Group Inc. Surgical cast venting device. 4,898,160, Cl. 128-91.00R.

Bruce, Charles F. Lobster trap. 4,897,953, Cl. 43-102.000.

Bruckert, Serge: *See*—
Lechelle, Alain; Guidat, Thierry; and Bruckert, Serge, 4,897,950, Cl. 42-62.000.

Brueggemann, Harry P., to Xerox Corporation. Wobble correction by two reflections on a facet without bow. 4,898,437, Cl. 350-6.700.

Brull, Robert A.; Del Signore, James R., II; and Walker, Alan H., to NCR Corporation. Print head carriage for matrix printer. 4,898,487, Cl. 400-354.000.

Brun, Norbert: *See*—
Blusseau, Eric; and Brun, Norbert, 4,899,261, Cl. 362-61.000.

Brunn, Oswald. Folding furniture. 4,898,421, Cl. 297-28.000.

Brunner, Heinz; and Sauter, Karl-Jurgen, to Sipra Patententwicklungs- Und Beteiligungsgesellschaft. Thread storing and supplying device for textile machines, particularly knitting machines. 4,898,337, Cl. 242-151.000.

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Bankstahl, Herbert A., 4,898,553, Cl. 440-76.000.
Phillips, George E.; and Griffiths, John M., 4,898,127, Cl. 123-73.00A.
Winberg, Arvid E.; and Gavriles, James N., 4,898,261, Cl. 184-6.220.

Bruah Switchgear Limited: *See*—
Stewart, John S., 4,899,247, Cl. 361-72.000.
Brydges, Ronald. Window-box and support. 4,897,958, Cl. 47-68.000.
Bubien, James K. Golf club grip cleaner. 4,897,892, Cl. 15-21.00C.
Bubik, Alfred: *See*—
Weisshuhn, Elmer; Bubik, Alfred; Dahl, Hans; Holik, Herbert; Kurtz, Rudiger; Zembrot, Anton; Stotz, Wolf-Gunter; Seider, Werner; and Trondle, Robert, 4,898,643, Cl. 162-259.000.
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Buchel, Karl H.; Holmwood, Graham; Kraatz, Udo; Kramer, Wolfgang; Reinecke, Paul; Brandes, Wilhelm; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Mercapto-substituted hydroxyethyl-(triazol-l-yl) derivatives. 4,898,875, Cl. 514-383.000.
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Buckley, Alan; Che, Tessie M.; Leslie, Thomas M.; Stamatoff, James B.; Stuetz, Dagobert E.; and Ulrich, Donald R., to Hoechst Celanese Corporation. Optical light switch or modulator device with a liquid crystalline composite optical component. 4,898,454, Cl. 350-350.00R.
Buckley, Alan: *See*—
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Budd, Russell A.: *See*—
Bates, Keith A.; Budd, Russell A.; Habegger, Millard A.; and Rhoades, Mark L., 4,899,327, Cl. 369-45.000.
Budde, Rolf: *See*—
Rossig, Manfred; and Budde, Rolf, 4,898,511, Cl. 414-792.600.
Buderus-Sell GmbH: *See*—
Schulz, Thilo; Schmitz, Karl-Heinz; and Schneider, Thomas, 4,898,426, Cl. 297-452.000.
Buese, George J.; and Yoon, Hee K., to Johnson & Johnson Orthopaedics, Inc. Ravel-free orthopaedic casting tapes. 4,898,159, Cl. 128-90.000.
Buffington, Larry J. Amusement apparatus. 4,898,383, Cl. 273-1.00G.
Buhler, Steven A.: *See*—
Elhatem, Abdul M.; and Buhler, Steven A., 4,599,180, Cl. 346-140.00R.
Buikema, Wolter, to Hollandse Signaalapparaten B.V. Switching helix power supply for a TWT. 4,899,113, Cl. 328-258.000.
Burgdorf, Marten; Kuhne, Wilhelm; and Maus, Udo-Hermann, to Mauser-Werker GmbH. Bunged vessel. 4,898,296, Cl. 220-72.000.
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VerWeyst, Gordon E.; Burk, Charles E.; and Pherigo, Douglas E., 4,898,292, Cl. 215-237.000.
Burlington Industries, Inc.: *See*—
Riggins, Phillip H.; and Hauser, Peter J., 4,898,596, Cl. 8-490.000.
Burt, Donald W.; and Hans, Gerald A., to Hughes Aircraft Company. Powder metal mirror. 4,898,711, Cl. 419-27.000.
Burton, Charles D. Hypochlorite distinfectant stabilized with calcium chelant. 4,898,681, Cl. 252-102.000.
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Butzen, James K., to Snap-on Tools Corporation. Fluid driven rotary motor. 4,898,524, Cl. 418-136.000.
Buxton, Clifford A., to Siemens Energy & Automation, Inc. Molded case circuit breaker housing reinforcement. 4,899,253, Cl. 361-376.000.
Byerly, David J.; Frates, Paul S.; and Scholl, Charles H., to Nordson Corporation. Apparatus for melting and dispensing thermoplastic material. 4,898,302, Cl. 222-49.000.
Bystrom, Olof L.; and Johansson, Sven-Erik V., to Sandvik AB. Tool for chip removing machining. 4,898,054, Cl. 82-160.000.
C-I-L Inc.: *See*—
Marz, Horst F., 4,898,066, Cl. 86-20.100.
Calderwood, Gary G.: *See*—
Rozak, Alexander T.; and Calderwood, Gary G., 4,898,091, Cl. 99-536.000.
California Institute of Technology: *See*—
Collins, Earl R., Jr., 4,898,631, Cl. 156-89.000.
Callaghan, Stephen P.: *See*—
Sewell, Wesley C.; and Callaghan, Stephen P., 4,898,469, Cl. 356-350.000.
Callahan, Thomas, to Thinking Machines Corporation. Flat cable support comb. 4,898,544, Cl. 439-498.000.
Camden, James B.: *See*—
Cox, William A.; Camden, James B.; and Roseberry, George L., 4,898,477, Cl. 383-33.000.
Campagnolo S.p.A.: *See*—
Romano, Antonio, 4,898,064, Cl. 74-594.600.
Campbell, Simon F.; Morris, David S.; and Roberts, David A., to Pfizer Inc. Imidazo[4,5-b]pyridyl quinolone cardiac stimulants. 4,898,872, Cl. 514-303.000.
Canada, National Research Concil of: *See*—
Tweedle, Thomas A.; Kutowy, Oleh; and Tremblay, Andre , 4,898,698, Cl. 264-41.000.
Canamer International, Inc.: *See*—
Double, Paul B.; Orr, Frederick W.; and Dotterwick, Robert E., 4,897,970, Cl. 52-4.000.
Canon, Inc.: *See*—
Hirata, Shinji; and Horinishi, Katsumi, 4,899,086, Cl. 315-169.300.
Canon Kabushiki Kaisha: *See*—
Edakubo, Hiroo; Itani, Takashi; Narasawa, Takashi; Ushiro, Tatsuzo; Watanabe, Hiroshi; and Hasegawa, Masahide, 4,899,236, Cl. 360-95.000.
Harada, Toshiaki; Yamamoto, Tadashi; and Takenouchi, Masanori, 4,899,175, Cl. 346-108.000.
Maeda, Masaya; Takimoto, Hiroyuki; and Kozuki, Susumu, 4,899,231, Cl. 360-33.100.
Miyakawa, Hideaki; and Kameyama, Makoto, 4,899,241, Cl. 360-125.000.
Murakami, Tsutomu; and Kanai, Masahiro, 4,898,118, Cl. 118-723.000.
Ogura, Tokihiko; Mizoguchi, Yoshiyuki; Ikeda, Keiichi; and Taguchi, Tomishige, 4,899,171, Cl. 346-76.0PH.
Okada, Shinjiro; Taniguchi, Osamu; Tsuboyama, Akira; and Enari, Masahiko, 4,898,456, Cl. 350-350.00S.
Osato, Yoichi; Saito, Ichiro; and Takasu, Yoshio, 4,899,168, Cl. 346-1.100.
Sugata, Masao; Den, Tohru; Ito, Susumu; Hirabayashi, Keiji; Ikoma, Keiko; Kurihara, Noriko; Osabe, Kuniji; Takeuchi, Tatsuo; Satomura, Hiroshi; Oguchi, Yoshihiro; Maruyama, Akio; and Saito, Keishi, 4,898,798, Cl. 430-58.000.
Tsukada, Masaharu; Aoi, Shigeru; and Ashinuma, Takaaki, 4,899,291, Cl. 364-518.000.
Yamada, Masanori, 4,899,227, Cl. 358-452.000.
Capet, Marc: *See*—
Bourzat, Jean-Dominique; Capet, Marc; Cotrel, Claude; Labaudiniere, Richard; Pitchen, Philippe; and Roussel, Gerard, 4,898,871, Cl. 514-300.000.
Carabbio, Robert M.: *See*—
Herbermann, Alfred F.; and Carabbio, Robert M., 4,898,490, Cl. 403-56.000.
Cardosi, Marco: *See*—
Turner, Anthony P. F.; Swain, Ann; Ramsay, Graham; Cardosi, Marco; and Schneider, Bernard H., 4,898,816, Cl. 435-34.000.
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Carey, William S.: *See*—
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Carney, Walter P., to Du Pont de Nemours, E. I., and Company. Monoclonal antibodies reactive with activated and oncogenic ras p21 proteins. 4,898,932, Cl. 530-387.000.
Caro, Perry A.: *See*—
Beard, Marian H.; Caro, Perry A.; Hsiao, Jennifer B.; Mackey, Kevin J.; Sandman, James G., Jr.; Steinbach, Gary R.; and Woods, Donald R., 4,899,136, Cl. 340-706.000.
Carson, John R., to McNeilab, Inc. Methods for the treatment of hypertension. 4,898,889, Cl. 514-654.000.
Carter, Gregory G. Tandem rod for casement windows. 4,898,409, Cl. 292-31.000.
Carver, George C.: *See*—
St. Angelo, Stephen, Jr.; Carver, George C.; Patterson, David W.; and Fremont, Owen K., 4,897,913, Cl. 29-450.000.
Casco Products Corporation: *See*—
Lupoli, Peter J.; Mattis, Donald J.; and Miller, Robert S., 4,899,263, Cl. 362-80.000.
Case, Arnold A.; and DeRoss, Robert, to Molex Incorporated. Connector assembly. 4,898,548, Cl. 439-686.000.
Case, Maxwell H.; Hartzell, Lawrence M.; and Currier, David W., to Motorola Inc. Heat sink clip and assembly and method of manufacture. 4,899,255, Cl. 361-386.000.
Casey, Michael E. Drycleaning residue aftercooker. 4,898,601, Cl. 55-341.00R.
Casio Computer Co., Ltd.: *See*—
Sano, Teruo; and Shioya, Masaharu, 4,899,228, Cl. 358-473.000.
Cassel, Donald D. High performance grinding king pin and associated apparatus. 4,898,398, Cl. 280-87.042.
Cassella Aktiengesellschaft: *See*—
Schonafinger, Karl; Beyerle, Rudi; and Schindler, Ursula, 4,898,866, Cl. 514-252.000.
Castlebury, Gerald E. Canopy apparatus for children's swings. 4,898,198, Cl. 135-90.000.
Catrel S.A. Societe D'Etudes et D'Applications Industrielle: *See*—
Trivino Vazquez, Fernando; and Clenin, Roger J., 4,898,615, Cl. 106-103.000.
Cavagna, Giancarlo A.; Groome, Ernest J.; Murphy, Joseph M.; and Raschella, Domenick L., to Westvaco Corporation. Method for making coated and printed packaging material on a printing press. 4,898,752, Cl. 427-265.000.
Cavallerano, Alan P.: *See*—
Basile, Carlo; Cavallerano, Alan P.; and Tsinberg, Mikhail, 4,899,220, Cl. 358-141.000.
Cawifield, Billy G., to SGS-Thomson Microelectronics, Inc. Single mask totally self-aligned power MOSFET cell fabrication process. 4,898,835, Cl. 437-29.000.
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Christian, David E., 4,899,115, Cl. 330-302.000.
Celduc S.A.: *See*—
Combette, Marc, 4,898,079, Cl. 92-5.00R.
Celltech Limited: *See*—
Kingsman, Alan J.; and Kingsman, Susan M., 4,898,823, Cl. 435-172.300.
Centre National D'Etudes Spatiales: *See*—
Rouzies, Christian, 4,899,269, Cl. 363-41.000.
Chakrabarti, Amiya K.; Kuhlman, George W., Jr.; and Seagle, Stanley R., to Aluminum Company of America. High performance Ti-6A1-4V forgings. 4,898,624, Cl. 148-11.50F.

Champagnac, Paul R., to Mecanique Generale J. DeVille Et Cie. Device for preventing backward movement for skis. 4,898,401, Cl. 280-605.000.

Chan, Ka-kong; and Saucy, Gabriel G., to Hoffmann-La Roche Inc. Natural Vitamin E intermediate. 4,898,953, Cl. 549-408.000.

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Chan, Kwan W., to Melitta-Werke Bentz & Sohn. Device for the production of aroma extracts from coffee or tea. 4,898,090, Cl. 99-306.000.

Chapin, David S., to Cooper Industries, Inc. Adjustable tape measure clip. 4,897,898, Cl. 24-3.00J.

Chapman, Leonard T. Motorized tang drive system. 4,899,097, Cl. 318-663.000.

Chapman, Lloyd R.: *See*—
Holcombe, Cressie E., Jr.; and Chapman, Lloyd R., 4,898,618, Cl. 106-287.340.

Charden, Eric: *See*—
Magninat, Michel; and Charden, Eric, 4,898,460, Cl. 351-114.000.

Charles Winn (Valves) Limited: *See*—
Burton, Philip J., 4,898,363, Cl. 251-173.000.

Charlton, Steven C.: *See*—
Albarella, James P.; Charlton, Steven C.; Reinsch, James W.; and Warchal, Mary E., 4,898,813, Cl. 435-4.000.

Che, Tessie M.; Stuetz, Dagobert E.; Buckley, Alan; and Ulrich, Donald R., to Hoechst Celanese Corporation. Inorganic-organic composite compositions exhibiting nonlinear optical response. 4,898,755, Cl. 427-389.700.

Che, Tessie M.: *See*—
Buckley, Alan; Che, Tessie M.; Leslie, Thomas M.; Stamatoff, James B.; Stuetz, Dagobert E.; and Ulrich, Donald R., 4,898,454, Cl. 350-350.00R.

Chen, Ching-Hwa: *See*—
Chen, Jiann-Jong; and Chen, Ching-Hwa, 4,897,887, Cl. 2-150.000.

Chen, Fu; and Carey, William S., to Betz Laboratories, Inc. Novel amine-containing copolymers and their use. 4,898,684, Cl. 252-181.000.

Chen, Ga-Lane: *See*—
Yamashita, Tsutomu T.; Shir, Ching-Cheng; Chen, Tu; and Chen, Ga-Lane, 4,898,774, Cl. 428-336.000.

Chen, Jiann-Jong; and Chen, Ching-Hwa. Preknotted adjustable necktie. 4,897,887, Cl. 2-150.000.

Chen, Tien-Tsung; Wegdell, C. Stefan; Rutkowski, Wayne L.; and Kao, Kim Y., to Avery International Corporation. Mailer for laser printer. 4,898,323, Cl. 229-92.300.

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Chenevey, Edward C.; and Kafchinski, Edward R., to Hoechst Celanese Corporation. Process for the production of biaxially oriented rigid rod heterocyclic liquid crystalline polymer films. 4,898,924, Cl. 528-183.000.

Cheng, Li-Jen; Gheen, Gregory O.; and Partovi, Afshin, to United States of America, National Aeronautics and Space Administration. Spatial light modulation in compound semiconductor materials. 4,898,436, Cl. 350-3.640.

Cherry, Sophia. Beautician's caddy. 4,898,281, Cl. 211-13.000.

Chesne, Andre ; Chevalier, Sylvie; Germain, Michel; and Pareau, Dominique, to Commissariat a l'Energie Atomique. Process for the recovery of acid organophosphorus compounds and/or organophosphate ions present in an aqueous solution. 4,898,963, Cl. 558-146.000.

Chevalier, Sylvie: *See*—
Chesne, Andre ; Chevalier, Sylvie; Germain, Michel; and Pareau, Dominique, 4,898,963, Cl. 558-146.000.

Chevrette, Roger: *See*—
Pickering, J. H.; Bhatia, Sushil K.; and Chevrette, Roger, 4,898,405, Cl. 281-29.000.

Chi, Jing-Shuen: *See*—
Jih, Ronald R. H.; and Chi, Jing-Shuen, 4,898,353, Cl. 24.8-188.700.

Chiba, Akihiko: *See*—
Ito, Junya; Chiba, Akihiko; Oku, Masuo; and Komada, Hitoshi, 4,897,933, Cl. 34-58.000.

Chiba, Minoru: *See*—
Kawachi, Hideya; and Chiba, Minoru, 4,898,452, Cl. 350-97.000.

Chips & Technologies, Inc.: *See*—
Fung, Michael G.; and Wang, Justin, 4,899,272, Cl. 365-230.030.

Cho, James Y.: *See*—
Sachs, Howard G.; Cho, James Y.; and Hollingsworth, Walter H., 4,899,275, Cl. 364-200.000.

Christensen, Stephen; and Rakel, Jay O., to Boeing Company, The. Poly(amide-imide) prepreg and composite processing. 4,898,754, Cl. 427-369.000.

Christian, David E., to CB Labs, Inc. System for controlling the dynamic range of electric musical instruments. 4,899,115, Cl. 330-302.000.

Chrysler Motors Corporation: *See*—
Hammond, Kenneth W.; Gilbert, Herbert W.; and Swierb, Gerald E., 4,899,262, Cl. 362-80.000.
Sway-Tin, Min, 4,899,256, Cl. 361-386.000.
Wroblewski, Thomas R., 4,899,338, Cl. 370-85.100.

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Chung, Kyung H.: *See*—
Ko, Jae K.; and Chung, Kyung H., 4,898,277, Cl. 206-387.000.

Cianflone, Robert A. Ceiling fan control wand. 4,899,050, Cl. 200-331.000.

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Eggert, Ute; Engel, Andreas; and Kramp, Ekkehard, 4,898,810, Cl. 430-523.000.
Wildmann, Daniel, 4,899,343, Cl. 372-9.000.

Ciba-Geigy Corporation: *See*—
Benjamin, Linda A.; Pastor, Stephen D.; and Luzzi, John J., 4,898,980, Cl. 568-23.000.
Falk, Robert A.; Clark, Kirtland P.; and Karydas, Athanasios, 4,898,981, Cl. 568-28.000.
Herold, Peter; and Angst, Christof, 4,898,977, Cl. 564-191.000.
Hunziker, Max, 4,898,927, Cl. 528-377.000.
Hutchison, Alan J.; Shaw, Kenneth R.; and Schneider, Josef A., 4,898,854, Cl. 514-89.000.
Parker, David C.; and Clubley, Brian G., 4,898,687, Cl. 252-389.610.
Pfeifer, Josef, 4,898,806, Cl. 430-325.000.
Ravichandran, Ramanathan; Pastor, Stephen D.; Seltzer, Raymond; and Patel, Ambelal R., 4,898,901, Cl. 524-237.000.
Szczepanski, Henry; and Wals, Lourens, 4,898,607, Cl. 71-92.000.

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Blusseau, Eric; and Brun, Norbert, 4,899,261, Cl. 362-61.000.

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Merton, Henry A., 4,899,392, Cl. 382-1.000.

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Cardoso, Joaquim P., 4,898,718, Cl. 422-211.000.

Citizen Watch Co., Ltd.: *See*—
Kato, Toshitake, 4,899,076, Cl. 310-356.000.

Claassen, Henning J. Apparatus for liquefying a thermoplastic high polymer material. 4,898,527, Cl. 425-143.000.

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Tesio, Franco, 4,898,669, Cl. 210-232.000.

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Akazawa, Shigeo; Mori, Masaharu; and Hamatsu, Masahiro, 4,899,364, Cl. 375-1.000.
Amazawa, Kiyoshi, 4,899,389, Cl. 381-94.000.

Clark, Brian; Jundt, Jacques; Luling, Martin; and Ross, Michael O., to Schlumberger Technology Corporation. Well logging apparatus and method for determining formation resistivity at a shallow and a deep depth. 4,899,112, Cl. 324-338.000.

Clark, Keith R.; and Richman, Philip, to UOP. Purification process for organic feedstocks. 4,899,016, Cl. 585-826.000.

Clark, Kirtland P.: *See*—
Falk, Robert A.; Clark, Kirtland P.; and Karydas, Athanasios, 4,898,981, Cl. 568-28.000.

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Clark, Maxwell J.; McMillan, Roy; and Ogden, Frank J., 4,898,251, Cl. 175-27.000.

Clausen, Earl W.: *See*—
Hubbard, Lloyd C.; and Clausen, Earl W., 4,898,518, Cl. 417-360.000.

Clauss, Allen D.; Culver, Gayle E.; Piatt, David M.; and Wierenga, Thomas J., to Proctor & Gamble Company, The. Detergent compatible, dryer released fabric softening/antistatic agents. 4,898,680, Cl. 252-8.800.

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Cleaveland, Edwin E., to Eastman Kodak Company. Apparatus and method for testing circular cylindrical or conical surfaces. 4,898,470, Cl. 356-359.000.

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Mazodier, Francois; and Paulhac, Rene , 4,898,013, Cl. 72-165.000.

Clenin, Roger J.: *See*—
Trivino Vazquez, Fernando; and Clenin, Roger J., 4,898,615, Cl. 106-103.000.

Cleveland Clinic Foundation, The: *See*—
Petre, John H., 4,898,176, Cl. 128-642.000.

Clifford, John F.; and Morrison, Fiona C. R., to Cookson Group PLC. Pigment compositions. 4,898,619, Cl. 106-459.000.

Clifft, Ricky C.; and Garrett, Melrose T. Oxygen controlling wastewater treatment method. 4,898,672, Cl. 210-614.000.

Clinipad Corporation, The: *See*—
Fernandez, Leonardo A., 4,898,732, Cl. 424-422.000.

Clubley, Brian G.: *See*—
Parker, David C.; and Clubley, Brian G., 4,898,687, Cl. 252-389.610.

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Rudick, Arthur G., 4,898,308, Cl. 222-325.000.

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Kuzma, Janusz, 4,898,183, Cl. 128-784.000.

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Coenen, Hubert; and Konrad, Reinhard, to Fried. Krupp GmbH. Process for the extraction of vanillin. 4,898,990, Cl. 568-438.000.
Coffey, James B.; and Gwynn, Leslie B., to NCR Corporation. Automated machine envelope. 4,898,322, Cl. 229-69.000.
Cohen, Aharon S.: *See*—
Karger, Barry L.; Paulus, Aran; Cohen, Aharon S.; and Nelson, Robert J., 4,898,658, Cl. 204-299.00R.
Cohen, Allen L. Holographic false nails. 4,898,192, Cl. 132-73.000.
Cohen, Joel B.; and Marhefka, Matthew, to Shell Containers, Inc. Molded closeable bin having a shaped hopper. 4,898,300, Cl. 220-334.000.
Cohen, Wayne E.; and Kralik, Donald M., to Latin Percussion, Inc. Block-type percussion instrument. 4,898,061, Cl. 84-402.000.
Cohn, Martin B. Cord-connected hood-backsplash. 4,898,149, Cl. 126-299.00R.
Coils, Inc.: *See*—
Blackburn, Raymond L., 4,897,916, Cl. 29-609.000.
Colas, Jean, to Commissariat a l'Energie Atomique. Machine for removing the spacing wire of nuclear fuel rods. 4,898,710, Cl. 376-261.000.
Cole, Paul W.: *See*—
Lindsey, Hiram E.; and Cole, Paul W., 4,898,243, Cl. 166-290.000.
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Misevich, Kenneth W.; and Mintel, Thomas E., 4,897,937, Cl. 36-43.000.
Colles, Joseph H., to Brooktree Corporation. Apparatus for converting digital values to analog values. 4,899,151, Cl. 341-145.000.
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Day, Victor S.; and Collette, David A., 4,897,982, Cl. 53-449.000.
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Colorocs Corporation: *See*—
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Francis, David W., 4,898,427, Cl. 298-22.00C.
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Allison, Joe D.; and Tillman, Richard M., 4,899,004, Cl. 585-321.000.
Page, Gary L., 4,897,977, Cl. 52-378.000.
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Clifford, John F.; and Morrison, Fiona C. R., 4,898,619, Cl. 106-459.000.
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Iizuka, Yunosuke; Ishii, Takashi; Mukawa, Yoshihiro; Nagata, Kouji; Matsumoto, Yoshitaka; and Murakami, Osamu, 4,899,277, Cl. 364-422.000.
Corley, Larry S., to Shell Oil Company. Process for halogensting cyclobutenoarenes. 4,898,999, Cl. 570-207.000.
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Rauschenbach, Kurt; and Lee, Charles A., 4,898,804, Cl. 430-311.000.
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Fong, Gerald D.; and Hultman, Sheryl L., 4,898,767, Cl. 428-210.000.
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Menestreau, Alain; Marchand, Maurice; Cornu, Alain; and Le Brun, Richard, 4,899,166, Cl. 343-873.000.
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Cucchi, Silvio; and Corradi, Vittorio, 4,899,352, Cl. 375-118.000.
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Moe, Rolf; Correia, David J.; and Downs, Michael, 4,898,639, Cl. 156-345.000.
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Bourzat, Jean-Dominique; Capet, Marc; Cotrel, Claude; Labaudiniere, Richard; Pitchen, Philippe; and Roussel, Gerard, 4,898,871, Cl. 514-300.000.
Cottenden, Alan M., to National Research Development Corporation. Incontinence apparel for females. 4,898,594, Cl. 604-397.000.
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Cox, William A.; Camden, James B.; and Roseberry, George L., to Procter & Gamble Company, The. Self-expanding flexible pouch. 4,898,477, Cl. 383-33.000.
Craig, James R. Fertilizer container for sprinkler system. 4,898,202, Cl. 137-268.000.
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Oglevee, J. Robert; and Craig, Richard, 4,897,957, Cl. 47-58.000.
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Lai, N. C. Joseph; Zuperku, Edward J.; and Henning, Roy A., 4,899,053, Cl. 250-343.000.
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Becker, Abram; Kornberg, Nurit; and Croitoru, Berta, 4,898,993, Cl. 568-658.000.
Cropek, Douglas A. Crank and sprocket drive. 4,898,047, Cl. 74-534.200.
Cross, Gerald: *See*—
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Crowley, Patrick J., to Beecham Group p.l.c. Syringe for a liquid pharmaceutical composition. 4,898,580, Cl. 604-90.000.
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Johnson, Donald A.; Hoots, John E.; Fong, Dodd W.; and Crucil, Guy A., 4,898,686, Cl. 252-389.200.
Crutcher, William C.; and Paysinger, Joseph R. Integrated geophysical survey system. 4,899,322, Cl. 367-59.000.
Cry, John W.; Kirkham, Randy R.; McBride, John F.; Simmons, Carver S.; and Gee, Glendon W., to Battelle Memorial Institute. Method and apparatus for selectively detecting one of two immiscible liquids in the presence of the other liquid. 4,899,047, Cl. 250-227.000.
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Cueto, Prudente G. Convertible baby feeding bottle. 4,898,290, Cl. 215-11.100.
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Clauss, Allen D.; Culver, Gayle E.; Piatt, David M.; and Wierenga, Thomas J., 4,898,680, Cl. 252-8.800.
Currier, David W.: *See*—
Case, Maxwell H.; Hartzell, Lawrence M.; and Currier, David W., 4,899,255, Cl. 361-386.000.
Curwood, Inc.: *See*—
Buchko, Raymond G.; and Halgren, John A., 4,897,985, Cl. 53-559.000.
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Cvijanovich, George B.: *See*—
Wu, Jeff C.; Cvijanovich, George B.; and Williams, Richard T., 4,898,650, Cl. 204-29.000.

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Dahlgren, Ray E. Moisture management sock. 4,898,007, Cl. 66-185.000.

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Nakamura, Shingo; and Nagahara, Hiroshi, 4,898,935, Cl. 536-119.000.

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Ito, Shigeo; Imaeda, Toshihiko; Takagi, Ryuhei; and Sato, Ryutaro, 4,898,317, Cl. 228-41.000.

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Isoda, Sumiro; Aibara, Shunzo; Miwa, Tamotsu; Fujiwara, Hiroyuki; Yokohama, Shuichi; and Matsumoto, Hiroo, 4,898,943, Cl. 544-251.000.

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Yoshimura, Tatsushiro; Tomihashi, Nobuyuki; and Simasaki, Shuhei, 4,898,779, Cl. 428-402.000.

Daimler Benz AG: *See*—
Kolle, Erwin; and Klink, Josef, 4,898,423, Cl. 297-362.000.
Lutz, Wolfgang; and Happel, Robert, 4,898,136, Cl. 123-269.000.
Roehringer, Arno, 4,898,074, Cl. 91-371.000.

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Motomura, Masatoshi; Muramatsu, Ichiro; Okoshi, Noboru; Araki, Yoshitami; Nomura, Kenichiro; Kozai, Takehisa; and Mita, Hiroshi, 4,898,617, Cl. 106-281.100.
Sato, Toshio; Matsumoto, Hitoshi; and Kakegawa, Hisao, 4,898,890, Cl. 514-685.000.

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Takeuchi, Shinji, 4,898,339, Cl. 242-231.000.

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Bailey, Denis M.; Lesher, George Y.; and D'Ambra, Thomas E., 4,898,880, Cl. 514-406.000.

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Jones, Ronald L., 4,898,083, Cl. 92-255.000.

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Jutand, Francis; Demassieux, Nicolas; and Dana, Michel, 4,899,300, Cl. 364-725.000.

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Benedetti, Giampietro; and Pasano, Fulvio, 4,898,227, Cl. 164-417.000.

Date, Haruyuki: *See*—
Osada, Koji; Date, Haruyuki; Saihara, Yasuhiro; Yamauchi, Toshiyuki; and Koike, Shiro, 4,898,727, Cl. 424-76.100.

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Bauer, Eric J.; Davenport, Esther L.; Kinal, Mary; and King, Michael C., 4,899,377, Cl. 379-354.000.

David, Lawrence D., to International Business Machines Corporation. Organometallic-derived cordierite and other compounds comprising oxides of silicon. 4,898,842, Cl. 501-9.000.

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Horton, Roger L., 4,898,697, Cl. 264-37.000.

Davis, David R.; Slayton, Danny L.; and Shook, Raymond J., to Colorocs Corporation. Fuser for use in an electrophotographic print engine. 4,899,197, Cl. 355-290.000.

Davis, Franklin J.; Wilcox, Gilbert B.; and Wright, Richard R., to United Technologies Corporation. Apparatus for a fuel system. 4,898,329, Cl. 239-13.000.

Davis, Gordon T.; and Mandalia, Baiju D., to International Business Machines Corporation. Tap rotation n fractionally spaced equalizer to compensate for drift due to fixed sample rate. 4,899,366, Cl. 375-14.000.

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Dawson, John F.; and Ronish, Edward W., to Honeywell Inc. Method of storage and retrieval of digital map data based upon a tessellated geoid system. 4,899,293, Cl. 364-521.000.

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Day, Victor S.; and Collette, David A., to Fulflex International Co. Plastic lined packaging. 4,897,982, Cl. 53-449.000.

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DeBlois, Raymond L.: *See*—
Nieter, Jeffrey J.; and DeBlois, Raymond L., 4,898,520, Cl. 418-1.000.

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Brierley, James A.; Brierley, Corale L.; Decker, Raymond F.; and Goyak, George M., 4,898,827, Cl. 435-244.000.

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Gage, Douglas M.; and Neagle, Stuart L., 4,898,078, Cl. 91-524.000.
Schweitz, Kenneth D.; and Benter, Dean W., 4,897,988, Cl. 56-202.000.

DeGiacomo, Ralph: *See*—
Liggett, Louis; McGuire, Michael; Palmer, Marcia; and DeGiacomo, Ralph, 4,898,744, Cl. 426-557.000.

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Rappoldt, Louis M.; and DeHaan, Peter H., 4,898,105, Cl. 110-245.000.

Dehmel, Rudiger: *See*—
Maelzer, Martin; Dehmel, Rudiger; Higgen, Hans-Hermann; and Gulzow, Andreas, 4,899,104, Cl. 324-158.00F.

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Bender, James G.; Herron, Lee F.; and Struthers, Keith D., 4,898,361, Cl. 251-129.050.

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Brull, Robert A.; Del Signore, James R., II; and Walker, Alan H., 4,898,487, Cl. 400-354.000.

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Kamp, Ronald P. T.; and De Meij, Johannes P., 4,899,025, Cl. 219-10.570.

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Sugata, Masao; Den, Tohru; Ito, Susumu; Hirabayashi, Keiji; Ikoma, Keiko; Kurihara, Noriko; Osabe, Kuniji; Takeuchi, Tatsuo; Satomura, Hiroshi; Oguchi, Yoshihiro; Maruyama, Akio; and Saito, Keishi, 4,898,798, Cl. 430-58.000.

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Pickering, J. H.; Bhatia, Sushil K.; and Chevrette, Roger, 4,898,405, Cl. 281-29.000.

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Ollmann, James E.; and DePasquale, Ralph J., 4,898,936, Cl. 536-17.100.

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Tropp, James S.; Derby, Kevin A.; and Hawryszko, K. Christine, 4,899,109, Cl. 324-320.000.

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Case, Arnold A.; and DeRoss, Robert, 4,898,548, Cl. 439-686.000.

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Murray, Gordon A.; Golobic, Robert A.; and Derrickson, Stephan G., 4,899,363, Cl. 372-65.000.

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Wells, Hoyt M.; Determan, William J.; Vanis, Vernon V.; Hrivnak, John E.; Richeson, Donald E.; and Saupe, Timothy P., 4,898,703, Cl. 264-166.000.

Detex Corporation: *See*—
Bartlett, Alan, 4,899,133, Cl. 340-573.000.

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Gleim, Gunter, 4,899,093, Cl. 318-254.000.

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Vuletic, Bogdan, 4,898,366, Cl. 266-160.000.

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McDermott, William C., 4,898,108, Cl. 111-185.000.

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Waldecker, Thomas J.; Dewar, Robert; Wybo, David R.; and Woroniec, Richard, 4,899,218, Cl. 358-93.000.

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Swisher, David R.; and DeWeese, F. Thane, 4,898,593, Cl. 604-319.000.

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Tropp, James S.; Derby, Kevin A.; and Hawryszko, K. Christine, 4,899,109, Cl. 324-320.000.

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Ferchau, Joerg U.; Pham, Hoa V.; and Diaz, Randall J., 4,899,254, Cl. 361-384.000.
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Horowitz, Carl; Sanduja, Mohan; and Dichter, Michael, deceased, 4,898,676, Cl. 210-668.000.
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Dick, William R.: *See*—
Easter, David A.; Dick, William R.; Hackman, Donald J.; and Alexander, Kathryn E., 4,898,051, Cl. 81-57.200.
Dickinson, Norman L., to Dipac Associates. Pressurized wet combustion of wastes in the vapor phase. 4,898,107, Cl. 110-346.000.
Dickore, Karlfried; Engels, Hans D.; Kratzer, Hans; and Merz, Walter, to Bayer Aktiengesellschaft. Production of 3,3-dimethyl-2-oxobutyric acid salt. 4,898,974, Cl. 562-577.000.
Dicks, Lori A.: *See*—
Dunaway, Thomas J.; Spielberger, Richard K.; and Dicks, Lori A., 4,898,320, Cl. 228-245.000.
Diesel Kiki Co., Ltd.: *See*—
Sakurada, Muneo, 4,898,325, Cl. 237-12.30B.
Sakurai, Yoshihiko, 4,898,005, Cl. 62-115.000.
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Hallowell, David L., 4,899,207, Cl. 357-70.000.
Hartzband, David J., 4,899,290, Cl. 364-513.000.
Sands, Robert M.; and Fitzgerald, John J., 4,899,082, Cl. 315-8.000.
Diman, Charles; Marcus, David; Mitchell, Philip; and Sachs, Samuel B., to Kendall Company, The. Point-of-use membrane filtration system. 4,898,667, Cl. 210-138.000.
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Mills, Perry A.; and DiMarco, Joel, 4,898,371, Cl. 269-136.000.
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Dickinson, Norman L., 4,898,107, Cl. 110-346.000.
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Dr. Ing. h.c.F. Porsche AG: *See*—
Ampferer, Herbert, 4,898,125, Cl. 123-52.0MC.
Brin, Constantin, 4,898,410, Cl. 292-241.000.
Dodin, Andre; Siffert, Odile; Le Thuillier, Georgette; and Allard, Patrice, to Institut Pasteur. Novel synthetic peptide, process for its preparation and medicaments containing it. 4,898,815, Cl. 435-7.000.
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Goldstein, Mark K.; and Dolnick, Earl M., 4,898,531, Cl. 431-12.000.
Donald Guthrie Foundation for Medical Research, Inc.: *See*—
Kwon, Byoung S., 4,898,814, Cl. 435-6.000.
Doni, Fabrizio; and Ferrario, Bruno, to SAES Getters SpA. Domestic oven observation window having a low temperature external surface. 4,898,147, Cl. 126-200.000.
Donnelly, Donald E.: *See*—
Brown, Bernard T.; Donnelly, Donald E.; and Toth, Bartholomew L., 4,898,229, Cl. 165-11.100.
Dorawala, Tansukhlal G.: *See*—
Pasternak, Mordechai; and Dorawala, Tansukhlal G., 4,898,674, Cl. 210-638.000.
Doree, Richard H.; and Ugro, Josef V., Jr., to Minnesota Mining and Manufacturing Company. Article containing microencapsulated materials. 4,898,633, Cl. 156-145.000.
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Kramer, Bernhard, 4,898,070, Cl. 89-34.000.
Dornier System GmbH: *See*—
Westphal, Manfred, 4,899,167, Cl. 343-915.000.
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Kumanoya, Masaki; Miyatake, Hideshi; Dosaka, Katsumi; and Konishi, Yasuhiro, 4,899,313, Cl. 365-201.000.
Doshi, Praful, to Pilkington Visioncare Holdings, Inc. Method for tinting hydrophilic plastic articles. 4,898,695, Cl. 264-2.600.
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Sask, David, 4,898,236, Cl. 166-65.100.
Downs, Michael: *See*—
Moe, Rolf; Correia, David J.; and Downs, Michael, 4,898,639, Cl. 156-345.000.
Draghi, Carlo: *See*—
Corbo, Leonard; and Draghi, Carlo, 4,898,217, Cl. 141-83.000.
Drake, Donald J.: *See*—
Hawkins, William G.; and Drake, Donald J., 4,899,181, Cl. 346-140.00R.
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Pipon, Yves; and Droulon, Georges, 4,898,356, Cl. 248-429.000.
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Hofmann, Robert F.; and Waldock, David B., 4,898,170, Cl. 606-166.000.
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Vassiliou, Eustathios, 4,898,020, Cl. 73-19.000.
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Daniel, Jean-Pierre L. M.; Dupuis, Phillipe; and Alanic, Jean-Luc, 4,899,163, Cl. 343-700.0MS.
Durston, Gordon G., to GSW Inc. Washroom partition. 4,897,971, Cl. 52-35.000.

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Hawkswell, Victor T., 4,898,507, Cl. 414-225.000.

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E & M Lamort: *See*—
Lamort, Jean-Pierre, 4,898,665, Cl. 209-273.000.

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Lindquist, Donald F., 4,899,052, Cl. 250-342.000.

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Alligood, John H., 4,899,187, Cl. 354-152.000.
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Helm, Michael J., 4,899,051, Cl. 250-340.000.
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Izumi, Masaki, 4,899,170, Cl. 346-76.0PH.
Jones, Glenn C.; and Nottingham, William D., 4,898,969, Cl. 560-187.000.
Mahoney, Gregory, 4,899,198, Cl. 355-297.000.
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Milch, James R., 4,898,467, Cl. 356-328.000.
Newman, David A.; Laubengayer, William R.; and Scott, William B., Jr., 4,899,174, Cl. 346-107.00R.
Newman, David A., 4,899,185, Cl. 346-155.000.

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Schultz, Gary R.; and Beverly, James A., 4,898,216, Cl. 141-4.000.
Searfoss, Jerry R.; and Keister, Bernard, 4,898,212, Cl. 138-130.000.

Eberly, David S. Padlock protector. 4,898,008, Cl. 70-56.000.

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Rayfield, Jerry W.; Baker, Robert; and Weber, Kenneth E., 4,898,620, Cl. 106-464.000.

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Mochizuki, Kiyofumi; Edagawa, Noboru; and Iwamoto, Yoshinao, 4,899,043, Cl. 250-227.000.

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Edelman, Elazar: *See*—
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Neuhaus, Klaus, 4,898,068, Cl. 81-483.000.

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Maitland, Arthur; and Livingstone, Ewan S., 4,899,362, Cl. 372-55.000.

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Horrobin, David F., 4,898,885, Cl. 514-560.000.

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Osaka, Takaaki; Matsui, Norio; Susaki, Shinichi; and Egawa, Yutaka, 4,897,918, Cl. 29-830.000.

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Bergfeld, Manfred; Eisenhuth, Ludwig; and Zengel, Hans, 4,898,978, Cl. 564-231.000.

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Bamberg, Peter; Ekstrom, Bertil A.; Forsgren, Ulf E.; and Sjoberg, Berndt O. H., 4,898,731, Cl. 424-114.000.

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Panoz, Donald E.; and Geoghegan, Edward J., 4,898,737, Cl. 424-468.000.

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Elliano, Jack L., 4,899,173, Cl. 346-82.000.

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Hershberger, Charles L.; Larson, Jeffrey L.; and Reynolds, Patricia A., 4,898,828, Cl. 435-252.300.

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Wolff, Erich; Lowski, Dieter; and Elias, Harry, 4,898,811, Cl. 430-546.000.

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Elkins, Johnny C. Remote operated hitch apparatus with safety interlock. 4,898,400, Cl. 280-427.000.

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Ellner, Sidney, to Ultraviolet Purification Systems, Inc. Cleaning system for ultraviolet light producing lamps. 4,899,056, Cl. 250-431.000.

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Brown, Bernard T.; Donnelly, Donald E.; and Toth, Bartholomew L., 4,898,229, Cl. 165-11.100.
Galloway, Peter E., 4,898,044, Cl. 74-424.600.

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Peck, Douglas J., 4,897,934, Cl. 34-78.000.

Enari, Masahiko: *See*—
Okada, Shinjiro; Taniguchi, Osamu; Tsuboyama, Akira; and Enari, Masahiko, 4,898,456, Cl. 350-350.00S.

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Sano, Yoshikazu; Kobayashi, Susumu; and Endo, Kiyoshi, 4,899,297, Cl. 364-557.000.

Endress u. Hauser GmbH u. Co.: *See*—
Herrmann, Rainer; and Funken, Dieter, 4,898,476, Cl. 374-28.000.

Engel, Andreas: *See*—
Eggert, Ute; Engel, Andreas; and Kramp, Ekkehard, 4,898,810, Cl. 430-523.000.

Engels, Hans D.: *See*—
Dickore, Karlfried; Engels, Hans D.; Kratzer, Hans; and Merz, Walter, 4,898,974, Cl. 562-577.000.

Engemann, Jurgen, to Leybold Aktiengesellschaft. Process for preparing extraction grids. 4,898,557, Cl. 445-49.000.

Enichem Synthesis S.p.A.: *See*—
Costanzi, Silvestro; Gussoni, Damiano; and Pallini, Luciano, 4,898,946, Cl. 546-216.000.

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Erck, Gary L.: *See*—
Davis, Michael H.; and Erck, Gary L., 4,899,040, Cl. 250-216.000.
Erdbrink, Robert J., to Heerema Engineering Service BV. Semi-submersible crane vessel. 4,898,288, Cl. 212-191.000.
Eriksen, Olof A. Steam/air ejector for generating a vacuum. 4,898,517, Cl. 417-151.000.
Eriksson, Carl E., to Iris Optics Ltd. Reading spectacles. 4,898,459, Cl. 351-46.000.
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Ertler, Stefan. Reserve parachute pack with pilot chute. 4,898,346, Cl. 244-148.000.
Erwin Sick GmbH Optik-Elektronik: *See*—
Fetzer, Gunter; and Meinert, Thomas, 4,899,041, Cl. 250-222.100.
Esche, Vordem: *See*—
Roth, Mario; Esche, Vordem; and Scholl, Heinz, 4,898,632, Cl. 156-99.000.
Establissement Public de Diffusion dit Telediffusion de France: *See*—
Bayetto, Jean-Christophe M.; and Vinatier, Claude J., 4,899,162, Cl. 343-700.0MS.
Ethyl Corporation: *See*—
Klobucar, W. Dirk; Kolich, Charles H.; and Books, Jeffrey T., 4,898,929, Cl. 528-399.000.
Livingston, Glen L.; Borges, John; and Mina, George L., 4,898,994, Cl. 568-720.000.
Eto, Takeaki: *See*—
Ito, Nobuhiko; Kinoshita, Kimio; Suzuki, Kiyonori; and Eto, Takeaki, 4,898,985, Cl. 568-344.000.
Euritech: *See*—
Reboul, Michel; and Glachet, Charles, 4,897,963, Cl. 49-507.000.
Euroceltique, S.A.: *See*—
Miller, Ronald B.; Halpern, Alfred; Leslie, Stewart; and Hofer, Peter, 4,898,729, Cl. 424-80.000.
Evans, Stephen A.: *See*—
Morris, Francis J.; and Evans, Stephen A., 4,898,838, Cl. 437-31.000.
Exxon Research and Engineering Company: *See*—
Broadhurst, Thomas E., 4,898,659, Cl. 208-33.000.
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Datta, Ravindra; and Eyman, Darrell P., 4,898,845, Cl. 502-3.000.
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Fahlen, Stefan M., to Aktiebolaget Electrolux. Vacuum cleaner nozzle. 4,897,894, Cl. 15-365.000.
Failla, Charles C.; Pouring, Andrew A.; Rankin, Bruce; di Priolo, Carlo L.; McCowan, William; and Gosewisch, Dennis, to Sonex Research, Inc. Piston and process for achieving controlled ignition and combustion of hydrocarbon fuels in internal combustion engines by generation and management of fuel radical species. 4,898,135, Cl. 123-263.000.
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Khan, Emdadur R., 4,899,308, Cl. 365-104.000.
Falex Corporation: *See*—
Voitik, Robert M., 4,898,394, Cl. 277-35.000.
Falk, Robert A.; Clark, Kirtland P.; and Karydas, Athanasios, to Ciba-Geigy Corporation. Heteroatom containing perfluoroalkyl terminated neopentyl glycols and compositions therefrom. 4,898,981, Cl. 568-28.000.
Falk, Robert A.; and Huggins, Raymond W., to Boeing Company, The. Integrated optic field sensor consisting of an interferometer formed in substrate. 4,899,042, Cl. 250-227.000.
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Kawamura, Hideaki; Fujibayashi, Kentaro; and Otsuki, Toshiaki, 4,899,096, Cl. 318-573.000.
Fanuc Ltd: *See*—
Kishi, Hajimu; Sakakibara, Shinsuke; and Karakama, Tatsuo, 4,899,095, Cl. 318-568.160.
Nakamura, Shigeo, 4,899,065, Cl. 307-270.000.
Farrell, Lee: *See*—
Montagna, John A.; Irving, Gary; Farrell, Lee; Cross, Gerald; and Miller, Stephen A., 4,899,292, Cl. 364-521.000.
Farrelly, Susan E.; and Spector, George. Personal blood pressure monitor. 4,898,180, Cl. 128-681.000.
Fasano, Fulvio: *See*—
Benedetti, Giampietro; and Fasano, Fulvio, 4,898,227, Cl. 164-417.000.
Faste, Rolf A., to Pharmetrix Corporation. Portable infusion device assembly. 4,898,582, Cl. 604-141.000.
Fasto B.V.: *See*—
Stapensea, Jan A., 4,898,146, Cl. 126-116.00A.
Favstritsky, Nicolai A., to Great Lakes Chemical Corporation. Water soluble organic ammonium per halides. 4,898,975, Cl. 564-2.000.
Fecher, Douglas A., to Allied-Signal Inc. One Piece rear seal for servomotor. 4,898,081, Cl. 92-165.00R.
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Fang, Jimmy, 4,898,260, Cl. 181-148.000.
Feinfocus Rontgensysteme GmbH: *See*—
Reinhold, Albert, 4,899,354, Cl. 378-34.000.
Fel, Jean-Louis. Non-slip means and their uses on shoe soles. 4,897,935, Cl. 36-7.700.
Feld, Fritz: *See*—
Oppermann, Gunter; and Feld, Fritz, 4,898,084, Cl. 73-118.100.
Felix Schoeller jr GmbH & Co. KG: *See*—
Dethlefs, Ralf-Burkhard; Scholz, Bernd; and Wysk, Wolfram, 4,898,773, Cl. 428-332.000.
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Ferag AG: *See*—
Reist, Walter, 4,898,336, Cl. 242-59.000.
Ferchau, Joerg U.; Pham, Hoa V.; and Diaz, Randall J., to Tandem Computers Incorporated. Electronic module interconnection system. 4,899,254, Cl. 361-384.000.
Fernandes, Jorge M.: *See*—
Kelly, Bryan M.; Fernandes, Jorge M.; Kelly, Matthew F.; and Kelly, Mark R., 4,898,391, Cl. 273-310.000.
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Ferrario, Bruno: *See*—
Doni, Fabrizio; and Ferrario, Bruno, 4,898,147, Cl. 126-200.000.
Ferro, Gregory A., to Imi-Tech Corporation. Cured polyimide foam structures and their production. 4,898,763, Cl. 428-159.000.
Ferrofluidics Corporation: *See*—
Raj, Kuldip; Gowda, Hanumaiah L.; and Moskowitz, Ronald, 4,898,480, Cl. 384-446.000.
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FFV Autotech Aktiebolag: *See*—
Hakansson, Olle, 4,898,566, Cl. 464-167.000.
Fiat Auto S.p.A.: *See*—
Puozzo, Luciano; and Manzin, Maurizio, 4,899,024, Cl. 219-10.410.
Fiedler, Christian, to Aeroquip GmbH. Fuel cooling device. 4,898,141, Cl. 123-541.000.
Fiedler, Lawrence D.: *See*—
Rasch, Diane M.; and Fiedler, Lawrence D., 4,898,903, Cl. 524-398.000.
Field, Frank P. Merchandise rack covering system. 4,898,285, Cl. 211-183.000.
Fields, Donald L., Jr.; Grabiak, Raymond C.; and Riley, Dennis P., to Monsanto Company. Process for producing N-phosphonomethylglycine. 4,898,972, Cl. 562-17.000.
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Fischell, Robert E.; and Fischell, Tim A., 4,898,575, Cl. 604-22.000.
Fischer, Bernd F.: *See*—
Muchnik, Boris J.; and Fischer, Bernd F., 4,898,529, Cl. 425-542.000.
Fischer, Dan E., to Ultradent Products, Inc. Apparatus used to facilitate the donning of elastic gloves. 4,898,309, Cl. 223-111.000.
Fischer, Gregory J.: *See*—
Hopkins, Larry K.; Fischer, Gregory J.; and Green, David G., 4,898,270, Cl. 198-396.000.
Fischer, Harry A.: *See*—
Ashida, Kaneyoshi, 4,898,893, Cl. 521-131.000.
Fischer, Reiner: *See*—
Sasse, Klaus; Fischer, Reiner; Santel, Hans-Joachim; and Schmidt, Robert R., 4,898,608, Cl. 71-94.000.
Fisher Dynamics Corporation: *See*—
Bell, Robert L., 4,898,424, Cl. 297-367.000.
Fisher, Stanley C., administrator: *See*—
Groshong, Leroy E.; Groshong, Judson C.; and Brawn, R. James, deceased, 4,898,579, Cl. 604-67.000.
Fitzgerald, John J.: *See*—
Sands, Robert M.; and Fitzgerald, John J., 4,899,082, Cl. 315-8.000.
Fitzgerald, Thomas H.; Razzano, John S.; and Stegman, Todd R., to General Electric Company. Polymer-densified fillers. 4,898,898, Cl. 523-351.000.

Fitzner, Klaus; Betz, Walter; Plitt, Uwe; and Schmitt, Wolfgang, to Heinrich Nickel GmbH. Laminarizer. 4,898,087, Cl. 98-40.100.

Flanigen, Edith M.: *See*—
Wilson, Stephen T.; Lok, Brent M.; and Flanigen, Edith M., 4,898,660, Cl. 208-114.000.

Fleischer, Willy: *See*—
Pontoppidan, Eskild; and Fleischer, Willy, 4,898,103, Cl. 108-144.000.

Fleming, Ian G. C.: *See*—
Jones, Raymond V. H.; and Fleming, Ian G. C., 4,898,997, Cl. 570-128.000.

Fletton, Richard A.: *See*—
Ward, John B.; Noble, Hazel M.; Porter, Neil; Fletton, Richard A.; and Noble, David, 4,898,821, Cl. 435-119.000.

FMC Corporation: *See*—
Borgwarth, Dennis, 4,898,071, Cl. 89-45.000.
Theodoridis, George, 4,898,606, Cl. 71-86.000.

Focke & Co. (GmbH & Co.): *See*—
Focke, Heinz; and Liedtke, Kurt, 4,898,569, Cl. 493-361.000.

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MacFadyen, David J.; Edwards, Robert G.; Wacks, Kenneth P.; and Foley, Daniel J., 4,899,129, Cl. 340-310.00R.
MacFadyen, David J.; Edwards, Robert G.; Wacks, Kenneth P.; and Foley, Daniel J., 4,899,217, Cl. 358-86.000.

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Johnson, Donald A.; Hoots, John E.; Fong, Dodd W.; and Crucil, Guy A., 4,898,686, Cl. 252-389.200.

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Ford Aerospace Corporation: *See*—
Yeh, Tso-ping, 4,898,030, Cl. 73-290.00V.

Forestier, Serge: *See*—
Lang, Gerard; Forestier, Serge; Lagrange, Alain; and Shroot, Braham, 4,898,883, Cl. 514-544.000.

Forsgren, Ulf E.: *See*—
Bamberg, Peter; Ekstrom, Bertil A.; Forsgren, Ulf E.; and Sjoberg, Berndt O. H., 4,898,731, Cl. 424-114.000.

Foster, William A., Jr.; and Pedrick, Vincent S., to Pedrick, Vincent S. Modular sun block system. 4,897,973, Cl. 52-102.000.

Fournier, Paul J. E.; and Reinker, Joseph F., Jr., to Aeroquip Corporation. Counterbalanced refueling arm assembly. 4,898,211, Cl. 137-615.000.

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Kadwell, Brian J.; Fowler, Daniel L.; and Gawron, Gregory F., 4,899,034, Cl. 219-494.000.

Fox, Rodney T.; and Goreham, Philip W., to Reckitt & Colman Products Limited. Emanator for volatile liquids. 4,898,328, Cl. 239-6.000.

Frama AG: *See*—
Haug, Werner, 4,898,093, Cl. 101-91.000.

Framatome: *See*—
Holcblat, Alain, 4,898,123, Cl. 122-379.000.
Lhuillier, Christian, 4,898,541, Cl. 439-248.000.

Francis, David W., to Commercial Intertech Coporation. Neutral stop device. 4,898,427, Cl. 298-22.00C.

Franckowiak, Gerhard; Bechem, Martin; Kayser, Michael; Gross, Rainer; Schramm, Matthias; Seuter, Friedel; Perzborn, Elisabeth; and Thomas, Gunther, to Bayer Aktiengesellschaft. [4-(6-Oxo-1,4,5,6-tetrahydro-3-pyridazinyl) anilino hexyl 1,4-dihydro-2,6 Di methyl 5 nitro 4 aryl pyridine 3-carboxylates. 4,898,865, Cl. 514-252.000.

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Newell, Edwin R.; and Franks, Terry E., 4,898,445, Cl. 350-96.200.

Frates, Paul S.: *See*—
Byerly, David J.; Frates, Paul S.; and Scholl, Charles H., 4,898,302, Cl. 222-49.000.

Fremont, Owen K.: *See*—
St. Angelo, Stephen, Jr.; Carver, George C.; Patterson, David W.; and Fremont, Owen K., 4,897,913, Cl. 29-450.000.

Freudenreich, Reinhold: *See*—
Voigt, Hartmut; and Freudenreich, Reinhold, 4,898,645, Cl. 203-67.000.

Frey, Yvonne; Kutzli, Jorg; Rauber, Walter; Schmocker, Hans; and Tobler, Markus, to Schweizerische Eidgenossenschaft vertreten durch die Eidg. Munitionsfabrick Thun der Gruppe fUr RUstungsdienste. Device for the rapid generation of a smoke screen and a method for preparing a smoke charge. 4,898,098, Cl. 102-334.000.

Freytais, Avrum; Hertel, Richard J.; and Mears, Eric L., to Varian Associates, Inc. Disk scanning apparatus for batch ion implanters. 4,899,059, Cl. 250-492.200.

Fridd, Petrina F.; and Taylor, Rosemary M., to Dow Corning Limited. Coloring keratinous material. 4,898,595, Cl. 8-405.000.

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Coenen, Hubert; and Konrad, Reinhard, 4,898,990, Cl. 568-438.000.

Friedman, Robert H.; and Surles, Billy W., to Texaco Inc. Processes for forming and using particles coated with a resin which is resistant to high temperature and high pH aqueous environments. 4,898,750, Cl. 427-221.000.

Friedrich, Claus: *See*—
Asdollahi, Norbert; Poerschke, Karl; Stark, Klaus; and Friedrich, Claus, 4,899,123, Cl. 337-273.000.

Friel, Daniel D. Knife sharpening apparatus. 4,897,965, Cl. 51-128.000.

Froehlich, Peter, to Hilti Aktiengesellschaft. Expansion dowel assembly with an expansion cone displaceable into an expansion sleeve. 4,898,505, Cl. 411-55.000.

Frost, George E. Support and protective base device for camera. 4,899,189, Cl. 354-293.000.

Frymaster Corporation, The: *See*—
Luebke, Clement J.; Slade, Frank A.; Sank, Gerald W.; Grob, James T.; Price, George M.; and Hubbard, Elbert M., 4,898,151, Cl. 126-391.000.

Fuerst, Rory W., to Kaepa, Inc. Shoe sole construction. 4,897,936, Cl. 36-30.00A.

Fuji Electric Co., Ltd.: *See*—
Fujita, Michiru; and Higuchi, Masao, 4,899,108, Cl. 324-318.000.
Ohtake, Shigeaki; Kogawa, Kuniyuki; and Hirota, Takato, 4,899,120, Cl. 335-132.000.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Kamo, Keisuke, 4,898,343, Cl. 244-12.400.
Sakai, Yasuhito, 4,898,050, Cl. 74-867.000.

Fuji Photo Film Co., Ltd.: *See*—
Aoai, Toshiaki; Aoshima, Keitaro; and Nagashima, Akira, 4,898,803, Cl. 430-191.000.
Aoki, Kozo; and Furutachi, Nobuo, 4,898,812, Cl. 430-548.000.
Hishinuma, Kazuhiro, 4,899,049, Cl. 250-327.200.
Hori, Hisamitsu, 4,899,194, Cl. 355-56.000.
Kaneko, Kiyotaka; Miyake, Izumi; Oda, Kazuya; Nakane, Yoshio; and Shimaya, Hiroshi, 4,899,212, Cl. 358-29.000.
Kubota, Kazuo, 4,899,245, Cl. 360-137.000.
Oishi, Kengo, 4,898,338, Cl. 242-198.000.
Otake, Katsumi, 4,897,943, Cl. 40-158.100.
Otake, Katsumi; Sakamoto, Kiichiro; and Kogane, Mikio, 4,897,944, Cl. 40-159.000.
Tatsumi, Setsuji; Shiota, Kazuo; Urabe, Hitoshi; and Shimazaki, Osamu, 4,899,216, Cl. 358-80.000.

Fuji Xerox Co., Ltd.: *See*—
Sasuga, Kazuyasu; Ishizawa, Hiroaki; Suzuki, Hisao; and Toho, Masato, 4,899,225, Cl. 358-448.000.
Tachibana, Hidekiyo; Noda, Akihiko; Terao, Kazuo; Honjou, Toshio; Seki, Yukio; Endo, Hiroshi; and Yokobari, Toshio, 4,898,801, Cl. 430-106.600.

Fujibayashi, Kentaro: *See*—
Kawamura, Hideaki; Fujibayashi, Kentaro; and Otsuki, Toshiaki, 4,899,096, Cl. 318-573.000.

Fujii, Hiroto: *See*—
Kyomen, Junsuke; Sakaguchi, Masayuki; and Fujii, Hiroto, 4,898,705, Cl. 264-242.000.

Fujii, Setsuro; Ishikawa, Hiroshi; Yasumura, Koichi; Jitsukawa, Koichiro; Toyama, Sachio; Tsubouchi, Hidetsugu; Sudo, Kimio; and Tsuji, Kouichi, to Otsuka Pharmaceutical Co., Ltd. 2-Oxa-isocephem compounds and compositions containing same. 4,898,859, Cl. 514-210.000.

Fujii, Setsuro; Hattori, Eizou; Hirata, Mitsuteru; Watanabe, Koichiro; Onogi, Kazuhiro; and Nagakura, Masahiko, to Kowa Co., Ltd. Benzoylpiperazine esters and a process for their production. 4,898,876, Cl. 544-391.000.

Fujimaki, Yoshihide; and Takenouchi, Shigeki, to Konica Corporation. Photoreceptor. 4,898,799, Cl. 430-59.000.

Fujimori, Shinya: *See*—
Kano, Kiyoshi; Kaku, Nobuyuki; Osawa, Atsuo; Fujimori, Shinya; and Fukagawa, Yoshihiro, 4,899,235, Cl. 360-85.000.

Fujimoto, Sachito; and Sugino, Takuya, to Honda Giken Kogyo K. K. Exhaust gas recirculation control method for internal combustion engines. 4,898,143, Cl. 123-571.000.

Fujimura, Setsuo: *See*—
Ishigaki, Naoyuki; Hamada, Takaki; and Fujimura, Setsuo, 4,898,613, Cl. 75-251.000.

Fujinuma, Chikao; Sekikawa, Nobuyuki; Tabata, Teruo; Takada, Tadayoshi; Sano, Yoshiaki; and Sadakata, Toshimasa, to Sanyo Electric Co., Ltd. Semiconductor integrated circuit and manufacturing method therefor. 4,898,839, Cl. 437-33.000.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Uemura, Toshinobu; Kai, Keiji; Kodani, Masateru; Yoshida, Fumiyo; and Aratani, Matsuhiko, 4,898,937, Cl. 540-227.000.

Fujita, Koichi: *See*—
Kanekiyo, Takazumi; Akimoto, Yukitoshi; Kubota, Miho; Fujita, Koichi; and Koizumi, Yasunori, 4,898,685, Cl. 252-353.000.

Fujita, Michiru; and Higuchi, Masao, to Fuji Electric Co., Ltd. High frequency coil. 4,899,108, Cl. 324-318.000.

Fujita, Minoru; and Shibata, Hirotaka, to Yamaha Hatsudoki Kabushiki Kaisha. Control device for vehicle. 4,898,137, Cl. 123-352.000.

Fujita, Takeshi: *See*—
Meguro, Kanji; Fujita, Takeshi; Hatanaka, Chitoshi; and Ooi, Satoru, 4,898,947, Cl. 546-280.000.

Fujita, Toshihiro; Ohya, Jun; Matsuda, Kenichi; and Serizawa, Hiroyuki, to Matsushita Electric Industrial Co., Ltd. Semiconductor laser device having monolithically formed active and passive cavities on the same substrate. 4,899,360, Cl. 372-50.000.

Fujita, Yukitoshi, to Sharp Kabushiki Kaisha. Image information apparatus. 4,899,192, Cl. 355-51.000.

Fujitani, Yuuki; and Kawakami, Kouji, to Aisin Seiki Kabushiki Kaisha. Four-wheel drive apparatus for automotive vehicles. 4,898,259, Cl. 180-250.000.

Fujitsu Limited: *See*—
Baba, Fumio; Kobayashi, Kazuya; Enomoto, Seiji; and Ogawa, Hiroaki, 4,899,310, Cl. 365-189.050.
Katsuhara, Wataru; and Arai, Shigeru, 4,899,325, Cl. 369-32.000.

Tochiyama, Kazunori; and Mihara, Takahisa, 4,899,237, Cl. 360-98.020.
Fujitsu VLSI Limited: *See—*
Baba, Fumio; Kobayashi, Kazuya; Enomoto, Seiji; and Ogawa, Hiroaki, 4,899,310, Cl. 365-189.050.
Fujiwara, Hiroyuki: *See—*
Isoda, Sumiro; Aibara, Shunzo; Miwa, Tamotsu; Fujiwara, Hiroyuki; Yokohama, Shuichi; and Matsumoto, Hiroo, 4,898,943, Cl. 544-251.000.
Fujiwara, Yoshiyasu: *See—*
Yumoto, Hideaki; Yonemura, Masao; Nagase, Mamoru; Yamada, Yoshito; Fujiwara, Yoshiyasu; Okamoto, Masakatsu; and Hosokawa, Yasutoshi, 4,898,022, Cl. 73-46.000.
Fujunuma, Chikao: *See—*
Takeda, Kazuo; Sekikawa, Nobuyuki; Hayasaka, Katsuhiro; Fujunuma, Chikao; Itoh, Nobuo; and Kubota, Tetsuya, 4,898,837, Cl. 437-31.000.
Fukagawa, Yoshihiro: *See—*
Kano, Kiyoshi; Kaku, Nobuyuki; Osawa, Atsuo; Fujimori, Shinya; and Fukagawa, Yoshihiro, 4,899,235, Cl. 360-85.000.
Fukahori, Yoshihide; Kojima, Hiromu; Ogino, Akihiko; Suzuki, Shigenobu; and Yoshizawa, Toshikazu, to Bridgestone Corporation. Anti-seismic device. 4,899,323, Cl. 367-176.000.
Fukao, Masami: *See—*
Suzukamo, Gohfu; Sakito, Yoji; Fukao, Masami; and Hagiya, Koji, 4,898,655, Cl. 204-157.870.
Fukase, Hiroshi: *See—*
Horii, Satoshi; and Fukase, Hiroshi, 4,898,986, Cl. 568-376.000.
Fukui, Hirotake: *See—*
Saeki, Takashi; Nii, Takayuki; Fukui, Hirotake; Mishina, Toshiro; Nakano, Haruo; and Sakakibara, Hitoshi, 4,899,158, Cl. 342-44.000.
Fukui, Isao; Hayahsi, Shuzo; and Miyama, Takao, to Shimadzu Corporation. Method and apparatus for emission spectroscopic analysis. 4,898,466, Cl. 356-313.000.
Fukui, Kensuke, to Sanyo Electric Co., Ltd. Electronic weighing apparatus. 4,898,254, Cl. 177-210.00C.
Fukui, Kiitiro: *See—*
Sato, Tsunenobu; and Fukui, Kiitiro, 4,898,765, Cl. 428-195.000.
Fukuizumi, Hideaki: *See—*
Yoshinari, Osamu; Kawakatsu, Yoshifumi; Takahashi, Hayashi; and Fukuizumi, Hideaki, 4,898,700, Cl. 264-83.000.
Fukumi, Hirokazu: *See—*
Takenaka, Yoshinori; Fukumi, Hirokazu; and Sekiguchi, Sadayoshi, 4,898,573, Cl. 604-6.000.
Fukushima, Tatuharu: *See—*
Ishikura, Tsukasa; and Fukushima, Tatuharu, 4,898,996, Cl. 568-938.000.
Fukuyama, Yuji: *See—*
Ishimochi, Haruki; Yamamura, Kimio; Fukuyama, Yuji; Yanai, Masato; and Takahashi, Satoshi, 4,899,139, Cl. 340-721.000.
Fulflex International Co.: *See—*
Day, Victor S.; and Collette, David A., 4,897,982, Cl. 53-449.000.
Fuller, Ernest, to Life Support, Inc. Back traction device for use with chairs. 4,898,185, Cl. 128-876.000.
Funabashi, Motohisa: *See—*
Onari, Mikihiko; Sekozawa, Teruji; and Funabashi, Motohisa, 4,899,280, Cl. 364-431.050.
Fung, Michael G.; and Wang, Justin, to Chips & Technologies, Inc. Addressing multiple types of memory devices. 4,899,272, Cl. 365-230.030.
Funken, Dieter: *See—*
Herrmann, Rainer; and Funken, Dieter, 4,898,476, Cl. 374-28.000.
Furukawa Electric Co., Ltd., The: *See—*
Shiga, Syoji; Matsuda, Akira; Shibata, Nobuyuki; and Akasaka, Kiichi, 4,898,318, Cl. 228-183.000.
Furukawa, Hiroshi; Uemichi, Sachio; Isoi, Toshihiro; and Kawakita, Kenzo, to Yuasa Battery Co., Ltd. Lead-acid storage battery. 4,898,796, Cl. 429-178.000.
Furukawa, Hiroshi, to Kabushiki Kaisha Toshiba. Magnetic resonance imaging apparatus with stabilized magnetic field. 4,899,110, Cl. 324-320.000.
Furutachi, Nobuo: *See—*
Aoki, Kozo; and Furutachi, Nobuo, 4,898,812, Cl. 430-548.000.
Furuya, Hirohide: *See—*
Iwasa, Hiroki; Watanabe, Toyofumi; and Furuya, Hirohide, 4,898,649, Cl. 204-28.000.
Furuya, Nobuo: *See—*
Kozoe, Katsutoshi; Furuya, Nobuo; Kimura, Shinichi; Okamoto, Yasunari; Kumada, Mitsuyoshi; Sugimoto, Tatsuo; Ueno, Takehiko; Shimizu, Kenjiro; and Itoh, Tsutomu, 4,898,116, Cl. 118-621.000.
Fusselman, David F.: *See—*
Elco, Richard A.; and Fusselman, David F., 4,898,546, Cl. 439-608.000.
Futaba Denshi Kogyo K.K.: *See—*
Kishino, Takao; Katayama, Minoru; Yano, Kazuyuki; and Ohtsuka, Isao, 4,899,081, Cl. 313-496.000.
Futami, Tohru; and Takeuchi, Mikio, to Nissan Motor Company, Limited. Keyless entry system for automotive vehicles. 4,898,010, Cl. 70-278.000.
Futur-Quotidien S.A.: *See—*
Surugue nee Lasnier, Evelyne; Lasnier, Hubert; and Perovitch, Phillipe, 4,898,572, Cl. 604-4.000.
Fux, Kamil; and Gresa, Ludwig. Filtering device for the separation of liquids and solids. 4,898,671, Cl. 210-333.010.
G & H Technology, Inc.: *See—*
Benze, Everett L., 4,898,543, Cl. 439-374.000.
Gabizon, Alberto: *See—*
Barenholz, Yechezkel; and Gabizon, Alberto, 4,898,735, Cl. 424-450.000.
Gabrlik, Zdenek: *See—*
Morris, John M.; Gabrlik, Zdenek; and Green, Charles J., 4,898,199, Cl. 137-68.100.
Gaffney, John H. Golf club head cover. 4,898,222, Cl. 150-160.000.
Gage, Douglas M.; and Neagle, Stuart L., to Deere & Company. Hydraulic system for a work vehicle. 4,898,078, Cl. 91-524.000.
Gaines, Ronald J., to Toledo Scale Corporation. Planar load cell. 4,898,255, Cl. 177-211.000.
Galil (Naharia) Advanced Technologies Ltd.: *See—*
Ovil, Yoel; and Levy, Morris, 4,898,155, Cl. 606-144.000.
Gallant, William E., to Borden, Inc. Harvesting, shucking and eviscerating clams at sea. 4,897,896, Cl. 17-74.000.
Gallenkamp, Bernd; Gunther, Andreas; Mohrmann, Karl-Heinrich; and Schmidt, Thomas, to Bayer Aktiengesellschaft. Process for preparing 1,3,5-triazinetriones. 4,898,979, Cl. 564-418.000.
Galloway, Peter E., to Emerson Electric Co. Cam-driven linear actuator apparatus. 4,898,044, Cl. 74-424.600.
Gariboldi, Roberto, to SGS-Thomson Microelectronics S.p.A. Low voltage drop series regulator with overvoltage and overcurrent protection. 4,899,098, Cl. 323-277.000.
Garrett, Melrose T.: *See—*
Cliffi, Ricky C.; and Garrett, Melrose T., 4,898,672, Cl. 210-614.000.
Garrett, Wayne H.; and Janson, David A., to Eaton Corporation. Double element electroviscous fluid clutch. 4,898,266, Cl. 192-21.500.
Garrett, Wayne H.; and Janson, David A., to Eaton Corporation. Electroviscous fluid clutch. 4,898,267, Cl. 192-21.500.
Gartner, Todd H., to Siemens Transmission Systems, Inc. Telephone circuit using DC blocked transformer and negative impedance technique. 4,899,382, Cl. 379-413.000.
Gatturna, Roland F.; Nicholson, James E.; and O'Leary, James, to Mitek Surgical Products, Inc. Suture anchor. 4,898,156, Cl. 606-72.000.
Gauthier, Michel; and Belanger, Andre, to Societe Nationale Elf Aquitaine; and Hydro-Quebec. Method of assembling components of an electrochemical generator using thin films of lithium. 4,897,917, Cl. 29-623.300.
Gavriles, James N.: *See—*
Winberg, Arvid E.; and Gavriles, James N., 4,898,261, Cl. 184-6.220.
Gawron, Gregory F.: *See—*
Kadwell, Brian J.; Fowler, Daniel L.; and Gawron, Gregory F., 4,899,034, Cl. 219-494.000.
Gay, Adrian C.: *See—*
Easton, Colin J.; and Gay, Adrian C., 4,899,294, Cl. 364-522.000.
Gebald, Gregor: *See—*
Rohner, Joachim, deceased; Langen, Manfred; and Gebald, Gregor, 4,897,991, Cl. 57-281.000.
Gebr. Eickhoff Maschinenfabrik u. Eisengieberei mbH: *See—*
Weber, Karl-Heinz, 4,898,428, Cl. 299-30.000.
Gee, Glendon W.: *See—*
Cry, John W.; Kirkham, Randy R.; McBride, John F.; Simmons, Carver S.; and Gee, Glendon W., 4,899,047, Cl. 250-227.000.
Geffs, John J. Apparatus and method for reducing effects of draft tube pressure fluctuations. 4,898,512, Cl. 415-1.000.
Gefrem: *See—*
Janowski, Valery, 4,898,492, Cl. 403-340.000.
Gehrmann, Klaus: *See—*
Erpenbach, Heinz; Gehrmann, Klaus; Horstermann, Peter; Jagers, Erhard; and Kohl, Georg, 4,898,966, Cl. 560-38.000.
Genentech, Inc.: *See—*
Goeddel, David V.; and Heyneker, Herbert L., 4,898,830, Cl. 435-320.000.
General Electric Company: *See—*
Barfod, Jesper M., 4,899,054, Cl. 250-369.000.
Fitzgerald, Thomas H.; Razzano, John S.; and Stegman, Todd R., 4,898,898, Cl. 523-351.000.
Kuchar, Norman R.; and Azad, Farzin H., 4,899,347, Cl. 372-33.000.
Miller, Paul A., 4,898,349, Cl. 244-161.000.
Rosen, Har'el; and Rosen, Arye, 4,899,204, Cl. 357-30.000.
General Electric Company, p.l.c., The: *See—*
McCrindle, John A.; Steiner, Antony F.; and Jackson, Andrew M., 4,899,036, Cl. 235-380.000.
General Foods Corporation: *See—*
Liggett, Louis; McGuire, Michael; Palmer, Marcia; and DeGiacomo, Ralph, 4,898,744, Cl. 426-557.000.
General Motors Corporation: *See—*
Bender, James G.; Herron, Lee F.; and Struthers, Keith D., 4,898,361, Cl. 251-129.050.
St. Angelo, Stephen, Jr.; Carver, George C.; Patterson, David W.; and Fremont, Owen K., 4,897,913, Cl. 29-450.000.
General Signal Corporation: *See—*
Schadler, John L., 4,899,165, Cl. 343-767.000.
General Signals, Inc.: *See—*
Barvinek, Todd A.; and Jensen, James W., 4,897,960, Cl. 49-49.000.
Gengler, Jeffrey R.: *See—*
Daly, Mark D.; Maerzke, James T.; Gengler, Jeffrey R.; and Trick, Robert E., 4,898,158, Cl. 128-79.000.
Genheimer, Stephen R., to Magnetic Peripherals Inc. Adaptive velocity profile for disk actuator control. 4,899,234, Cl. 360-78.060.

Geoghegan, Edward J.: *See—*
Panoz, Donald E.; and Geoghegan, Edward J., 4,898,737, Cl. 424-468.000.

Georgakis, Evangelos G., to Unitek Corporation. Storage and dispensing box for small components. 4,898,276, Cl. 206-369.000.

George, Gordon P. Transtracheal airway and placement device. 4,898,163, Cl. 128-200.260.

George, Raymond A.: *See—*
Singh, Prabhakar; Ruka, Roswell J.; and George, Raymond A., 4,898,792, Cl. 429-19.000.

Gergen, William P.; and Lutz, Robert G., to Shell Oil Company. Modified block copolymers functionalized in the monoalkenyl aromatic or vinylarene block. 4,898,914, Cl. 525-314.000.

Germain, Michel: *See—*
Chesne, Andre ; Chevalier, Sylvie; Germain, Michel; and Pareau, Dominique, 4,898,963, Cl. 558-146.000.

Germann, Alfred: *See—*
Buchecker, Richard; Germann, Alfred; Kelly, Stephen; and Schadt, Martin, 4,898,455, Cl. 350-350.00R.

Gerritsen, Gerrit B.: *See—*
Vriens, Leendert; Gerritsen, Gerrit B.; and Van Alphen, Willem M., 4,899,080, Cl. 313-477.00R.

Gewerkschaft Eisenhutte Westfalia GmbH: *See—*
Konig, Johannes, 4,899,332, Cl. 370-32.000.

Geyser, Joseph E.; and Kozbur, Nestor, to James River Corporation. Apparatus for forming a bulk package. 4,897,980, Cl. 53-128.000.

Ghahariiran, Mehdi. Child monitoring device. 4,899,135, Cl. 340-573.000.

Gheen, Gregory O.: *See—*
Cheng, Li-Jen; Gheen, Gregory O.; and Partovi, Afshin, 4,898,436, Cl. 350-3.640.

Gheorghiu, Mihnea: *See—*
Salajka, Zdenek; Hamrik, Odlrich; Kratochvila, Jan; Gheorghiu, Mihnea; Krivanek, Josef; Sindelar, Pavel; Zaloudik, Petr; Legeza, Vasil; and Jansa, Ladislav, 4,898,847, Cl. 522-110.000.

Gibson, Harold L.: *See—*
Schiavo, Anthony P.; Selby, Paul H., III; and Gibson, Harold L., 4,899,147, Cl. 341-60.000.

Giede, Karl: *See—*
Hoeffkes, Horst; Seidel, Kurt; Giede, Karl; Struve, Alfred; and Gruber, Bert, 4,898,725, Cl. 424-70.000.

Gilbert, Herbert W.: *See—*
Hammond, Kenneth W.; Gilbert, Herbert W.; and Swierb, Gerald E., 4,899,262, Cl. 362-80.000.

Gildemeister, Hans-H.: *See—*
Epper, Wolfgang; and Gildemeister, Hans-H., 4,898,571, Cl. 494-26.000.

Gilman, Paul S.; and Zedalis, Michael S., to Allied-Signal Inc. Friction-actuated extrusion of rapidly solidified high temperature Al-base alloys and product. 4,898,612, Cl. 75-249.000.

Gimenez, Philippe: *See—*
Bommier, Christophe; Gimenez, Philippe; Kucza, Jean-Claude; and Rabiet, Jacques, 4,898,646, Cl. 204-1.00T.

Ginzburg, Vladimir B.; and Vidil, F. Ronald, to United Engineering, Inc. Roll shifting system for rolling mills. 4,898,014, Cl. 72-247.000.

Giordano, Vincent: *See—*
Cyr, Normand; Tetu, Michel; and Giordano, Vincent, 4,899,345, Cl. 372-32.000.

Gist-Brocades N.V.: *See—*
Van Kotes, Gerard; Van Der Steen, Frederick H.; and Jastrzebski, Johann T. B. H., 4,898,955, Cl. 556-12.000.

Glachet, Charles: *See—*
Reboul, Michel; and Glachet, Charles, 4,897,963, Cl. 49-507.000.

Gleim, Gunter, to Deutsche-Thomson Brandt GmbH. Circuitry for electronically commutating a direct-current motor. 4,899,093, Cl. 318-254.000.

Glindsjo, Per. Method for gascleaning and a device for the accomplishment of the method. 4,898,720, Cl. 423-210.000.

Glover, Douglas W.; and Harner, Donald R., to AMP Incorporated. Surface mount HDI contact. 4,898,539, Cl. 439-81.000.

Gluck, Julius: *See—*
Berson, William; Gluck, Julius; Murphy, Patrick; Smith, Christopher D.; and Tran, Duc H., 4,899,172, Cl. 346-76.0PH.

Glyco Antriebstechnik GmbH: *See—*
Damitz, Joerg P., 4,898,026, Cl. 73-118.100.

Go, Yasunao: *See—*
Araki, Morio; Mori, Shigeto; Kaneko, Michihiro; and Go, Yasunao, 4,899,138, Cl. 340-712.000.

Goeckeler, William F.: *See—*
Simon, Jaime; Wilson, David A.; Volkert, Wynn A.; Troutner, David E.; and Goeckeler, William F., 4,898,724, Cl. 424-1.100.

Goeddel, David V.; and Heyneker, Herbert L., to Genentech, Inc. Human growth hormone DNA. 4,898,830, Cl. 435-320.000.

Goff, Jay T.: *See—*
Mendenhall, David W.; and Goff, Jay T., 4,899,099, Cl. 324-158.00F.

Goldbeck, Larry J.: *See—*
Swinderman, R. Todd; Bowman, Michael A.; and Goldbeck, Larry J., 4,898,272, Cl. 198-841.000.

Golden Aluminum Company: *See—*
Hopkins, Larry K.; Fischer, Gregory J.; and Green, David G., 4,898,270, Cl. 198-396.000.

Goldmann, Peter; Habelt, Gerhard; and Weihs, Hans, to U.S. Philips Corporation. Scanning device for a chip card. 4,899,035, Cl. 235-441.000.

Goldstar Co., Ltd.: *See—*
Oh, Ki Tae, 4,899,026, Cl. 219-10.55M.

Goldstein, Mark K.; and Dolnick, Earl M., to Quantum Group, Inc. Photosensitive control of electrically powered emissive ignition devices. 4,898,531, Cl. 431-12.000.

Goletz, Louis D. Combined ring toss and ball roll games. 4,898,392, Cl. 273-336.000.

Gollan, Arye Z., to A/G Technology Corporation. Cartridge bonding. 4,898,670, Cl. 210-232.000.

Golobic, Robert A.: *See—*
Murray, Gordon A.; Golobic, Robert A.; and Derrickson, Stephan G., 4,899,363, Cl. 372-65.000.

Gonnam, Russel W.: *See—*
Einolf, Charles W., Jr.; Shutterly, Harold B.; Sun, Shan C.; Gonnam, Russel W.; Ray, Roger E.; Koch, Karl C.; and Maynard-Nenno, Pamela M., 4,899,383, Cl. 380-48.000.

Gonzales, Adela: *See—*
Lockwood, Arthur H.; and Gonzales, Adela, 4,898,834, Cl. 437-22.000.

Goody Products, Inc.: *See—*
Tiramani, Paolo M. B., 4,898,307, Cl. 222-207.000.

Goodyear Tire & Rubber Company, The: *See—*
Botzman, Thomas J.; and Landers, Samuel P., 4,898,223, Cl. 152-547.000.
Wells, Hoyt M.; Determan, William J.; Vanis, Vernon V.; Hrivnak, John E.; Richeson, Donald E.; and Saupe, Timothy P., 4,898,703, Cl. 264-166.000.

Gopinath, Bhaskarpillai; and Li, Shuo-Yen R., to Bell Communications Research, Inc. High capacity communication system over collision-type channels. 4,899,143, Cl. 340-825.500.

Gopon, Gunter, to Karsten Baumann. Base for holding a plaster of paris model of a set of teeth. 4,898,359, Cl. 249-54.000.

Gordon, Joel D. Multi-exercise system. 4,898,381, Cl. 272-117.000.

Goreham, Philip W.: *See—*
Fox, Rodney T.; and Goreham, Philip W., 4,898,328, Cl. 239-6.000.

Gorodissky, Boris P.; Lotts, Jury A.; and Veretenov, Lev N., to Moskovskoe Nauchno-Proizvod-stennoe Obiedinenie "Biophizpribor". Decive for lubricating hydrodynamic bearings. 4,898,262, Cl. 184-6.400.

Gorrie Advertising Management Limited: *See—*
Whittington, Paul S.; and Morison, James, 4,898,354, Cl. 248-225.100.

Gose, William C.: *See—*
Hyche, Kenneth W.; and Gose, William C., 4,898,616, Cl. 106-271.000.

Gosewisch, Dennis: *See—*
Failla, Charles C.; Pouring, Andrew A.; Rankin, Bruce; di Priolo, Carlo L.; McCowan, William; and Gosewisch, Dennis, 4,898,135, Cl. 123-263.000.

Goto, Tamotsu: *See—*
Nishimura, Makoto; Nonaka, Takashi; Uenishi, Isao; and Goto, Tamotsu, 4,897,990, Cl. 57-247.000.

Gotoh, Manabu, to Ushio Denki. Method of exposing a peripheral part of wafer. 4,899,195, Cl. 355-77.000.

Gould, Herbert J., to International Rectifier Corporation. Schottky diode with titanium or like layer contacting the dielectric layer. 4,899,199, Cl. 387-15.000.

Gould, Inc.: *See—*
Luce, Betty M.; and Berdan, Betty L., 4,898,647, Cl. 204-13.000.

Goulette, Stephen D., to Aeroquip Corporation. Angle indicating caliper. 4,897,931, Cl. 33-810.000.

Gouvernelle, Didier, to Sprague Electric Company. Solid electrolyte capacitor with integral fuse. 4,899,258, Cl. 361-534.000.

Gowda, Hanumaiah L.: *See—*
Raj, Kuldip; Gowda, Hanumaiah L.; and Moskowitz, Ronald, 4,898,480, Cl. 384-446.000.

Goyak, George M.: *See—*
Brierley, James A.; Brierley, Corale L.; Decker, Raymond F.; and Goyak, George M., 4,898,827, Cl. 435-244.000.

Grabiak, Raymond C.: *See—*
Fields, Donald L., Jr.; Grabiak, Raymond C.; and Riley, Dennis P., 4,898,972, Cl. 562-17.000.

Grable, Richard J. Optical light probe. 4,898,172, Cl. 128-397.000.

Granberg, Dirk N.; Suchomel, Frank H.; and Ryno, Robert W., to A. O. Smith Corporation. Scale agitator. 4,898,124, Cl. 122-382.000.

Granberg, Helge O.: *See—*
Roehrs, Don P.; and Granberg, Helge O., 4,899,116, Cl. 330-251.000.

Grand Rapids Controls, Inc.: *See—*
Mancewicz, James M.; and Bosworth, William R., Jr., 4,898,046, Cl. 74-502.500.

Grangarde Maskin AB: *See—*
Linderholm, Stig, 4,898,218, Cl. 144-2.00Z.

Grantom, Charles A. Pipe supporting device. 4,898,238, Cl. 166-75.100.

Gray, Coy J., to Milliken Research Corporation. Method to produce three-ply yarn and fabric made therefrom. 4,897,989, Cl. 57-239.000.

Gray, Tommy L., to Span Instruments, Inc. Flow responsive transmitter and indicator. 4,898,036, Cl. 73-861.740.

Great Lakes Chemical Corporation: *See—*
Favstritsky, Nicolai A., 4,898,975, Cl. 564-2.000.

Green, Charles J.: *See—*
Morris, John M.; Gabrlik, Zdenek; and Green, Charles J., 4,898,199, Cl. 137-68.100.

Green, David G.: *See—*
Hopkins, Larry K.; Fischer, Gregory J.; and Green, David G., 4,898,270, Cl. 198-396.000.

Greenberg, Jerald: *See*—
Hawkins, Brian; Greenberg, Jerald; Alon, Ofer; Marten, Victor; Banyai, Edward; Edwards, Jennifer A.; Banyai, David M.; Sanchez, Juan C.; Sitnik, Eran; and Yozzo, Joseph A., 4,898,182, Cl. 128-707.000.

Greenwald, Martin: *See*—
Talanker, Vera; and Greenwald, Martin, 4,899,100, Cl. 324-636.000.

Greer, David G., to AgriChem, Inc. Feed grain conditioning apparatus. 4,898,092, Cl. 99-487.000.

Greer, Steven C., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Test interface circuit which generates different interface control signals for different target computers responding to control signals from host computer. 4,899,306, Cl. 364-900.000.

Gregoire, Jean-Pierre, to SMH Alcatel. Transport device for transporting objects in the form of strip segments. 4,898,313, Cl. 226-197.000.

Grehier, Alain; and Rojey, Alexandre, to Institut Francais Du Petrole. Heat exchange device useful more particularly for heat exchanges between gases. 4,898,233, Cl. 165-166.000.

Gresa, Ludwig: *See*—
Fux, Kamil; and Gresa, Ludwig, 4,898,671, Cl. 210-333.010.

Griffiths, John M.: *See*—
Phillips, George E.; and Griffiths, John M., 4,898,127, Cl. 123-73.00A.

Grilliot, Mary I.: *See*—
Grilliot, William L.; and Grilliot, Mary I., 4,897,886, Cl. 2-81.000.

Grilliot, William L.; and Grilliot, Mary I. Firefighter's garments having minimum weight and excellent protective qualities. 4,897,886, Cl. 2-81.000.

Grimaud, Jean-Michel; and Nozeran, Jean-Marc, to Bendix Electronics S.A. Device for triggering an event in phase with an angular position of a rotary component and application thereof. 4,899,281, Cl. 364-431.040.

Grimes, Gary J.; Haas, Lawrence J.; and Sauer, Jon R., to American Telephone and Telegraph Company; and AT&T Information Systems Inc. Non-invasive optical coupler. 4,898,444, Cl. 350-96.150.

Grob, James T.: *See*—
Luebke, Clement J.; Slade, Frank A.; Sank, Gerald W.; Grob, James T.; Price, George M.; and Hubbard, Elbert M., 4,898,151, Cl. 126-391.000.

Grobb, Finn; Hvalso, Kurt; and Madsen, Benni, to Gyproc A/S. Method and tool for punching plaster plates. 4,898,056, Cl. 83-689.000.

Groome, Ernest J.: *See*—
Cavagna, Giancarlo A.; Groome, Ernest J.; Murphy, Joseph M.; and Raschella, Domenick L., 4,898,752, Cl. 427-265.000.

Gropp, Heiko U., to Rheinmetall GmbH. Weapon and ammunition carrier for a gun. 4,898,072, Cl. 89-45.000.

Groshong, Judson C.: *See*—
Groshong, Leroy E.; Groshong, Judson C.; and Brawn, R. James, deceased, 4,898,579, Cl. 604-67.000.

Groshong, Leroy E.; Groshong, Judson C.; and Brawn, R. James, deceased (by Fisher, Stanley C., administrator), to Pump Controller Corporation. Infusion pump. 4,898,579, Cl. 604-67.000.

Gross, Anthony E., to Nalco Chemical Company. Polymeric ore agglomeration aids. 4,898,611, Cl. 75-3.000.

Gross, Rainer: *See*—
Franckowiak, Gerhard; Bechem, Martin; Kayser, Michael; Gross, Rainer; Schramm, Matthias; Seuter, Friedel; Perzborn, Elisabeth; and Thomas, Gunther, 4,898,865, Cl. 514-252.000.
Meyer, Horst; Schwenner, Eckhard; Bechem, Martin; Gross, Rainer; Schramm, Matthias; Kayser, Michael; and Hebisch, Siegbert, 4,898,877, Cl. 514-521.000.

Grozdits, George A.: *See*—
Israel, Michael G.; Grozdits, George A.; and Trout, Kenneth G., 4,898,776, Cl. 428-336.000.

Gruber, Bert: *See*—
Hoeffkes, Horst; Seidel, Kurt; Giede, Karl; Struve, Alfred; and Gruber, Bert, 4,898,725, Cl. 424-70.000.

Gruber, Robert J.: *See*—
Hsieh, Bing R.; Gruber, Robert J.; and Haack, John L., 4,898,802, Cl. 430-110.000.

Gruber, Thomas J. Selectively openable filtering assembly. 4,898,602, Cl. 55-359.000.

Gruenbaum, William T.; Mey, William; and Robinson, Kelly S., to Eastman Kodak Company. Multiple xeroprinted copies from a single exposure using photosensitive film buffer element. 4,898,797, Cl. 430-51.000.

Grundei, Hans, to S+G Implants GmbH. Forceps for pushing apart vertebrae. 4,898,161, Cl. 606-105.000.

Gruner, Heiko, to Plasmainvent AG. CR_2O_3-protective coating and process for its manufacture. 4,898,785, Cl. 428-472.000.

GSW Inc.: *See*—
Durston, Gordon G., 4,897,971, Cl. 52-35.000.
Lewis, Brian, 4,898,150, Cl. 126-361.000.

GT Development Corporation: *See*—
Morris, John M.; Gabrlik, Zdenek; and Green, Charles J., 4,898,199, Cl. 137-68.100.

GTE Hawaiian Telephone Company Incorporated: *See*—
Lee, Gerritt S. K., 4,899,381, Cl. 379-393.000.

GTE Laboratories Incorporated: *See*—
Rourke, William J.; Lai, Wen-Chao; and Natansohn, Samuel, 4,898,719, Cl. 423-21.500.

GTE Products Corporation: *See*—
Cooper, David A., 4,898,448, Cl. 350-96.200.
Jones, Gerald M., 4,898,215, Cl. 140-105.000.
Ritsko, Joseph E.; Johnson, Walter A.; and Kopatz, Nelson E., 4,898,749, Cl. 427-216.000.
Shaffer, John W., 4,898,558, Cl. 445-53.000.

GTE Valenite Corporation: *See*—
Cusack, Robert F., 4,897,930, Cl. 33-644.000.

Gueret, Jean-Louis, to L'Oreal. Brush for the application of cosmetic products. 4,898,193, Cl. 132-218.000.

Guidat, Thierry: *See*—
Lechelle, Alain; Guidat, Thierry; and Bruckert, Serge, 4,897,950, Cl. 42-62.000.

Guirguis, Raafat H. Liquid turbojet engine. 4,897,995, Cl. 60-221.000.

Gulzow, Andreas: *See*—
Maelzer, Martin; Dehmel, Rudiger; Higgen, Hans-Hermann; and Gulzow, Andreas, 4,899,104, Cl. 324-158.00F.

Gunn, William L.; Heath, William D., Jr.; and Mantovani, John C., to Brink's Incorporated. Apparatus for coin sorting and counting. 4,898,564, Cl. 453-3.000.

Gunther, Andreas: *See*—
Gallenkamp, Bernd; Gunther, Andreas; Mohrmann, Karl-Heinrich; and Schmidt, Thomas, 4,898,979, Cl. 564-418.000.

Gunze Limited: *See*—
Ikada, Yoshito; Suong, Hyu H.; Shimizu, Yoshihiko; Watanabe, Satoshi; Nakamura, Tatsuo; Suzuki, Masakazu; and Shimamoto, Takeshi, 4,898,186, Cl. 606-62.000.

Gupta, Balaram B. G., to Hoechst Celanese Corporation. Process for the preparation of poly(vinylphenol) from poly(acetoxystyrene) by acid catalyzed transesterification. 4,898,916, Cl. 525-344.000.

Gussoni, Damiano: *See*—
Costanzi, Silvestro; Gussoni, Damiano; and Pallini, Luciano, 4,898,946, Cl. 546-216.000.

Gustavsson, Bert U., to Profish International AB. Apparatus for baiting long lines. 4,897,954, Cl. 43-27.400.

Gwynn, Leslie B.: *See*—
Coffey, James B.; and Gwynn, Leslie B., 4,898,322, Cl. 229-69.000.

Gyproc A/S: *See*—
Grobb, Finn; Hvalso, Kurt; and Madsen, Benni, 4,898,056, Cl. 83-689.000.

H.Y.O., Inc.: *See*—
Kime, James A.; and McMenamin, Gregory R., 4,898,333, Cl. 239-657.000.

Haack, John L.: *See*—
Hsieh, Bing R.; Gruber, Robert J.; and Haack, John L., 4,898,802, Cl. 430-110.000.

Haas, Lawrence J.: *See*—
Grimes, Gary J.; Haas, Lawrence J.; and Sauer, Jon R., 4,898,444, Cl. 350-96.150.

Habegger, Millard A.: *See*—
Bates, Keith A.; Budd, Russell A.; Habegger, Millard A.; and Rhoades, Mark L., 4,899,327, Cl. 369-45.000.

Habelt, Gerhard: *See*—
Goldmann, Peter; Habelt, Gerhard; and Weihs, Hans, 4,899,035, Cl. 235-441.000.

Hachimori, Hideo: *See*—
Nagai, Tomoaki; Yamanashi, Hideyuki; and Hachimori, Hideo, 4,898,902, Cl. 524-275.000.

Hackman, Donald J.: *See*—
Easter, David A.; Dick, William R.; Hackman, Donald J.; and Alexander, Kathryn E., 4,898,051, Cl. 81-57.200.

Hackney, John. Catamaran sailboat user support platforms and packaged elements therefore. 4,898,111, Cl. 114-61.000.

Hadassah Medical Organization: *See*—
Barenholz, Yechezkel; and Gabizon, Alberto, 4,898,735, Cl. 424-450.000.

Haefliger, William W.: *See*—
Watson, W. Keith R., 4,898,884, Cl. 514-553.000.

Haga, Toru; Nagano, Eiki; Morita, Kouichi; and Sato, Ryo, to Sumitomo Chemical Company, Limited. Benzothiazolylazolidines, and their production and use. 4,898,948, Cl. 548-171.000.

Hagin, Faust; and Martini, Stefan, to MAN Nutzfahrzeuge GmbH. Low-loss cyclically-operating pressure-responsive bypass valve for fixed displacement pump flow control. 4,897,996, Cl. 60-468.000.

Hagiya, Koji: *See*—
Suzukamo, Gohfu; Sakito, Yoji; Fukao, Masami; and Hagiya, Koji, 4,898,655, Cl. 204-157.870.

Hahnle, Reinhard: *See*—
Schlafer, Ludwig; Springer, Hartmut; and Hahnle, Reinhard, 4,898,933, Cl. 534-605.000.

Hakansson, Olle, to FFV Autotech Aktiebolag. Overload-protected torque transmitting telescopic shaft. 4,898,566, Cl. 464-167.000.

Halasz, Ferenc: *See*—
Antal, Kalman; Rimay, Bela; and Halasz, Ferenc, 4,898,554, Cl. 445-6.000.

Halberstadt, Louis; Mertinooke, Peter E.; Perry, Joseph V.; and Muessel, Dan C., to Amesbury Industries, Inc. Process and apparatus for extruding a low density elastomeric thermoplastic foam. 4,898,760, Cl. 428-122.000.

Halgren, John A.: *See*—
Buchko, Raymond G.; and Halgren, John A., 4,897,985, Cl. 53-559.000.

Hall, Antony H. P.: *See*—
Dave , Dilip; and Hall, Antony H. P., 4,899,006, Cl. 585-415.000.

Hall, David M.: *See*—
McCullough, Francis P., Jr.; Hotchkiss, Robert L.; Snelgrove, R. Vernon; Hall, David M.; and McCullough, Jacqueline R., 4,898,783, Cl. 428-408.000.

Hall, Ginger L.: *See*—
Baile, Gnaneshwar R.; McVannel, Donald E.; Reading, Kirsten L.; and Hall, Ginger L., 4,898,961, Cl. 556-479.000.

Halliburton Company: *See*—
Stegemoeller, Calvin L.; and Walker, Lonnie R., 4,898,473, Cl. 366-132.000.

Halloran, Daniel J.; Kasprzak, Kenneth A.; Savastano, Stefano G.; and Swihart, Terence J., to Dow Corning Corporation. Water sheeting zwitterionomeric aminofunctional siloxanes. 4,898,614, Cl. 106-3.000.

Hallowell, David L., to Digital Equipment Corporation. Outer lead tape automated bonding. 4,899,207, Cl. 357-70.000.

Halm, Roland L.: *See*—
Dosaj, Vishu D.; Halm, Roland L.; and Wilding, Oliver K., Jr., 4,898,960, Cl. 556-472.000.

Halpern, Alfred: *See*—
Miller, Ronald B.; Halpern, Alfred; Leslie, Stewart; and Hofer, Peter, 4,898,729, Cl. 424-80.000.

Haluska, Loren A.; Michael, Keith W.; and Tarhay, Leo, to Dow Corning Corporation. Compositions of platinum and rhodium catalyst in combination with hydrogen silsesquioxane resin. 4,898,907, Cl. 524-490.000.

Hamada, Mitsuo; Shimizu, Koji; and Wakita, Haruki, to Toray Silicone Company, Ltd. Electroconductive silicone rubber particles. 4,898,689, Cl. 252-510.000.

Hamada, Takaki: *See*—
Ishigaki, Naoyuki; Hamada, Takaki; and Fujimura, Setsuo, 4,898,613, Cl. 75-251.000.

Hamaguchi, Shigeki: *See*—
Asada, Masanori; Hamaguchi, Shigeki; Katsuki, Hidetoshi; Nakamura, Yoshio; Takahashi, Hideyuki; Takahara, Kenji; Shimada, Yoshio; Ohashi, Takehisa; and Watanabe, Kiyoshi, 4,898,822, Cl. 435-121.000.

Hamamoto, Toshikazu: *See*—
Sanada, Makoto; Yamashita, Hiroshi; Izawa, Shinichiro; and Hamamoto, Toshikazu, 4,898,131, Cl. 123-90.440.

Hamanaka, Izumi: *See*—
Hirabayashi, Tsugio; and Hamanaka, Izumi, 4,898,372, Cl. 270-53.000.

Hamatsu, Masahiro: *See*—
Akazawa, Shigeo; Mori, Masaharu; and Hamatsu, Masahiro, 4,899,364, Cl. 375-1.000.

Hamblin, Ronald F., to SKF (UK) Limited. Bearing assembly. 4,898,481, Cl. 384-581.000.

Hamdy, Esmat Z.; Mohsen, Amr M.; and McCullum, John L., to Actel Corporation. Electrically-programmable low-impedance anti-fuse element. 4,899,205, Cl. 357-51.000.

Hamer, William C. Telephone announcement system. 4,899,378, Cl. 379-374.000.

Hammond, Kenneth W.; Gilbert, Herbert W.; and Swierb, Gerald E., to Chrysler Motors Corporation. Attachment arrangement for vehicle tail lamp assembly. 4,899,262, Cl. 362-80.000.

Hammond, Thomas J.; and Mason, Lawrence J., to Xerox Corporation. Triggering circuit for series connected flash lamps. 4,899,087, Cl. 315-241.00P.

Hamrik, Odlrich: *See*—
Salajka, Zdenek; Hamrik, Odlrich; Kratochvila, Jan; Gheorghiu, Mihnea; Krivanek, Josef; Sindelar, Pavel; Zaloudik, Petr; Legeza, Vasil; and Jansa, Ladislav, 4,898,847, Cl. 522-110.000.

Han, William T.; and Wright, John J., to Bristol-Myers Company. Preparation of antihypercholesterolemic tetrazole compounds. 4,898,950, Cl. 548-253.000.

Hannecart, Etienne, to Solvay & Cie. Compositions based on vinylidene fluoride polymers whic' have a reduced smoke-generating capacity. 4,898,906, Cl. 524-406.000.

Hannig, Helmut, to Alfing Kessler Sondermaschinen GmbH. Clamping device for pallets. 4,898,269, Cl. 198-346.100.

Hans, Gerald A.: *See*—
Burt, Donald W.; and Hans, Gerald A., 4,898,711, Cl. 419-27.000.

Hansen, Barry W.; and Romon, Raymond F., to International Business Machines Corporation. Dynamic terminal address allocation by the terminal itself in a data processing system. 4,899,274, Cl. 364-200.000.

Hansen, J. Richard; Asars, Juris A.; and Oates, Robert M., to Westinghouse Electric Corp. Optically coupled remote sensor apparatus and system. 4,899,044, Cl. 250-227.000.

Hansen, Ove E.; and Healy, Christopher P., to A/A Niro Atomizer. Atomizer wheel with bushings of different inwardly protruding lengths. 4,898,331, Cl. 239-223.000.

Happel, Robert: *See*—
Lutz, Wolfgang; and Happel, Robert, 4,898,136, Cl. 123-269.000.

Hara, Hirotaka: *See*—
Morita, Hideki; Sugawara, Kazuhiro; Hung, Pe-Chieh; Hara, Hirotaka; Nakamura, Tadashi; Kobayashi, Kazuyuki; Azuma, Masashi; and Katsuta, Tsuyoshi, 4,899,215, Cl. 358-78.000.

Hara, Masanori: *See*—
Kurihara, Junichi; and Hara, Masanori, 4,898,764, Cl. 428-188.000.

Harada, Ichiya: *See*—
Kiyohara, Kazuto; Yamazaki, Toshiaki; Harada, Ichiya; Nakadate, Takanori; Noguchi, Kentaro; Nakano, Michiteru; Sakae, Shigeru; and Okuma, Kazuhiro, 4,898,897, Cl. 523-343.000.

Harada, Teruhiro: *See*—
Kitazawa, Shooji; Kuwabara, Hiroshi; and Harada, Teruhiro, 4,899,309, Cl. 365-189.010.

Harada, Toshiaki; Yamamoto, Tadashi; and Takenouchi, Masanori, to Canon Kabushiki Kaisha. Recording system with illumination means utilizing a plurality of fluorescent substances. 4,899,175, Cl. 346-108.000.

Harakawa, Takeshi: *See*—
Nakayashiki, Susumu; Kashio, Jiro; Harakawa, Takeshi; Bekki, Yoshinori; and Yamaga, Mitsuhiro, 4,899,142, Cl. 340-825.050.

Harandi, Mohsen N.; and Owen, Hartley, to Mobil Oil Corp. Integrated staged conversion of methanol to gasoline and distillate. 4,899,002, Cl. 585-312.000.

Harandi, Mohsen N.; and Owen, Hartley, to Mobil Oil Corp. Process for olefins to gasoline conversion. 4,899,015, Cl. 585-533.000.

Harner, Donald R.: *See*—
Glover, Douglas W.; and Harner, Donald R., 4,898,539, Cl. 439-81.000.

Harpell, Gary A.: *See*—
Kavesh, Sheldon; Prevorsek, Dusan C.; and Harpell, Gary A., 4,897,902, Cl. 28-166.000.

Harrington, Robert, to Dunlop Limited a British Company. Footwear reinforcement. 4,897,939, Cl. 36-108.000.

Harter, Lynn J., to Thrall Car Manufacturing Company. Vehicle hopper body with internal reinforcing members. 4,898,101, Cl. 105-247.000.

Hartzband, David J., to Digital Equipment Corporation. System for specifying and executing protocols for using iterative analogy and comparative induction in a model-based computation system. 4,899,290, Cl. 364-513.000.

Hartzell, Lawrence M.: *See*—
Case, Maxwell H.; Hartzell, Lawrence M.; and Currier, David W., 4,899,255, Cl. 361-386.000.

Harwath, Frank L., to Suntec Industries Incorporated. Gear pump with ring-type shaft retainer. 4,898,523, Cl. 418-70.000.

Harwood, H. James; Majumdar, Ramendra N.; and Yang, Shih-Liang, to University of Akron. Alternating copolymerization of donor monomers having protected amine groups with acceptor monomers. 4,898,915, Cl. 525-326.700.

Hasebe, Yoichi, to Shinano Kenshi Kabushiki Kaisha. Two-phase DC brushless motor. 4,899,075, Cl. 310-257.000.

Hasegawa, Masahide: *See*—
Edakubo, Hiroo; Itani, Takashi; Narasawa, Takashi; Ushiro, Tatsuzo; Watanabe, Hiroshi; and Hasegawa, Masahide, 4,899,236, Cl. 360-95.000.

Hashida, Koichi: *See*—
Kohno, Teruhisa; Hashida, Koichi; and Takata, Koji, 4,898,434, Cl. 303-119.000.

Hashimoto, Masashi, to Texas Instruments Incorporated. Video information editing system for providing video data in a controlled format. 4,899,229, Cl. 360-141.000.

Hashimoto, Mitsuru: *See*—
Shimada, Tomoyuki; Sasaki, Masaomi; Hashimoto, Mitsuru; and Aruga, Tamotsu, 4,898,800, Cl. 430-59.000.

Hashizume, Kenji; Ikebe, Masaru; Okamura, Masatoshi; and Shiba, Haruo, to TDK Corporation. Locking mechanism of magnetic tape cassette. 4,899,242, Cl. 360-132.000.

Hata, Daisuke, to Ricoh Company, Ltd. Zooming optical system control device. 4,899,190, Cl. 354-400.000.

Hatanaka, Chitoshi: *See*—
Meguro, Kanji; Fujita, Takeshi; Hatanaka, Chitoshi; and Ooi, Satoru, 4,898,947, Cl. 546-280.000.

Hatkoski, James W.: *See*—
Tapley, Robin R.; Hatkoski, James W.; and Hatkoski, Richard J., 4,898,113, Cl. 114-283.000.

Hatkoski, Richard: *See*—
Tapley, Robin R.; Hatkoski, James W.; and Hatkoski, Richard J., 4,898,113, Cl. 114-283.000.

Hatkoski, Richard J.: *See*—
Tapley, Robin R.; Hatkoski, James W.; and Hatkoski, Richard J., 4,898,113, Cl. 114-283.000.

Hattori, Eizou: *See*—
Fujii, Setsuro; Hattori, Eizou; Hirata, Mitsuteru; Watanabe, Koichiro; Onogi, Kazuhiro; and Nagakura, Masahiko, 4,898,876, Cl. 544-391.000.

Hattori, Katsuhide: *See*—
Tasaki, Yoji; Kurokawa, Koichi; Hattori, Katsuhide; Takano, Mikio; Miyajima, Toshikazu; Sato, Toshifumi; and Ogasawara, Katsura, 4,898,095, Cl. 102-201.000.

Hattori, Reiko: *See*—
Hitoshio, Akio; Takamatsu, Hisao; and Hattori, Reiko, 4,898,820, Cl. 435-95.000.

Hauber, Peter. Safe and secure camper shell door latch. 4,898,408, Cl. 292-7.000.

Haug, Werner, to Frama AG. Franking machine. 4,898,093, Cl. 101-91.000.

Haury, Andre : *See*—
Belbel, Elie; Blanchard, Christian; Haury, Andre ; and Lauraire, Michel, 4,899,119, Cl. 335-14.000.

Hauser, Peter J.: *See*—
Riggins, Phillip H.; and Hauser, Peter J., 4,898,596, Cl. 8-490.000.

Havens, Marvin R., to W. R. Grace & Co.-Conn. Agent for imparting antistatic characteristics to a thermoplastic polymer and a thermoplastic polymer composition containing the agent. 4,898,771, Cl. 428-316.000.

Havenstein, Alfred G.; Kahle, Werner; and Schnell, Dagmar, to Lever Brothers Company. Package containing a water-in-oil fat dispersion. 4,898,740, Cl. 426-106.000.

Hawie Manufacturing Co., The: *See*—
Hawie, Robert L., 4,897,952, Cl. 43-21.200.

Hawie, Robert L., to Hawie Manufacturing Co., The. Fishing rod hanger. 4,897,952, Cl. 43-21.200.

Hawkins, Brian; Greenberg, Jerald; Alon, Ofer; Marten, Victor; Banyai, Edward; Edwards, Jennifer A.; Banyai, David M.; Sanchez, Juan C.; Sitnik, Eran; and Yozzo, Joseph A. Apparatus for evaluating heart fitness. 4,898,182, Cl. 128-707.000.

Hawkins, William G.; and Drake, Donald J., to Xerox Corporation. Large monolithic thermal ink jet printhead. 4,899,181, Cl. 346-140.00R.

Hawkinson, Rodney B.; and Sarto, Julius A. Merchandise display rack. 4,898,282, Cl. 211-49.100.

Hawkswell, Victor T., to Dynapert, Inc. Apparatus for handling electrical or electronic components. 4,898,507, Cl. 414-225.000.

Hawryszko, K. Christine: *See*—
Tropp, James S.; Derby, Kevin A.; and Hawryszko, K. Christine, 4,899,109, Cl. 324-320.000.

Hay, John; Markhoff-Matheny, Carole J.; and Swanson, Brian E., to Norton Company. Frit bonded abrasive wheel. 4,898,597, Cl. 51-298.000.

Hayahsi, Shuzo: *See*—
Fukui, Isao; Hayahsi, Shuzo; and Miyama, Takao, 4,898,466, Cl. 356-313.000.

Hayakawa, Toshiro; Suyama, Takahiro; Takahashi, Kohsei; Kondo, Masafumi; and Yamamoto, Saburo, to Sharp Kabushiki Kaisha. Semiconductor laser device. 4,899,349, Cl. 372-44.000.

Hayasaka, Katsuhiro: *See*—
Takeda, Kazuo; Sekikawa, Nobuyuki; Hayasaka, Katsuhiro; Fujunuma, Chikao; Itoh, Nobuo; and Kubota, Tetsuya, 4,898,837, Cl. 437-31.000.

Hayashi, Shigeyuki: *See*—
Horaguchi, Yoichi; Tomizawa, Takashi; Hayashi, Shigeyuki; Ohno, Motoshi; and Nakata, Takashi, 4,899,193, Cl. 355-55.000.

Hayata, Osamu, to Yamaha Hatsudoki Kabushiki Kaisha. Low slung small vehicle. 4,898,508, Cl. 414-476.000.

Hayes, Dorothy E. Time-variable illuminating device. 4,899,089, Cl. 215-323.000.

Healey, Fritz W.: *See*—
Taylor, Leo O.; and Healey, Fritz W., 4,899,039, Cl. 250-209.000.

Healy, Christopher P.: *See*—
Hansen, Ove E.; and Healy, Christopher P., 4,898,331, Cl. 239-223.000.

Hearn, David D.; Pasternack, Eric S.; and Segalman, Daniel J., to Atlantic Richfield Company. Downhole tool for determining in-situ formation stress orientation. 4,899,320, Cl. 367-35.000.

Heath, William D., Jr.: *See*—
Gunn, William L.; Heath, William D., Jr.; and Mantovani, John C., 4,898,564, Cl. 453-3.000.

Hebisch, Siegbert: *See*—
Meyer, Horst; Schwenner, Eckhard; Bechem, Martin; Gross, Rainer; Schramm, Matthias; Kayser, Michael; and Hebisch, Siegbert, 4,898,877, Cl. 514-521.000.

Heck, James V.; and Lewis, Michael D., to Merck & Co. Inc. Acetylenic esters. 4,898,853, Cl. 514-63.000.

Heck, Wolfgang: *See*—
Springer, Johann; and Heck, Wolfgang, 4,899,223, Cl. 358-302.000.

Heerema Engineering Service BV: *See*—
Erdbrink, Robert J., 4,898,288, Cl. 212-191.000.
van de Wetering, Wietse J., 4,898,289, Cl. 212-270.000.

Heide, Jan B., to Skarhamn International AB. Method for thawing of food articles. 4,898,741, Cl. 426-231.000.

Heilmann, Steven M.: *See*—
Katritzky, Alan R.; Krepski, Larry R.; Rasmussen, Jerald K.; Heilmann, Steven M.; and Tarr, Richard D., 4,898,923, Cl. 528-73.000.

Heinrich Nickel GmbH: *See*—
Fitzner, Klaus; Betz, Walter; Plitt, Uwe; and Schmitt, Wolfgang, 4,898,087, Cl. 98-40.100.

Heller, Jorge; Penhale, Donald W. H.; and Ng, Steve Y., to Sandoz Pharmaceuticals Corp. Polyacetal and polyketal hydrogels formed from acetals or ketals and polyols. 4,898,928, Cl. 528-392.000.

Helm, Michael J., to Eastman Kodak Company. Method and device for simulating thermal effects at the interface of a magnetic head and a recording medium. 4,899,051, Cl. 250-340.000.

Helmling, Walter: *See*—
Schwaiger, Gunther; Springer, Hartmut; and Helmling, Walter, 4,898,944, Cl. 544-337.000.

Hemmeter, Richard W.: *See*—
Bauer, Thomas M.; Hemmeter, Richard W.; Petrelli, Robert; Piereth, Richard J.; and Rubald, Cyrenus M., 4,899,375, Cl. 379-264.000.

Hempel, Gerhard; Kennecke, Mario; Krieger, Bernhard; Phillippson, Rainer, Triem, Hermann; and Weber, Alfred, to Schering Aktiengesellschaft. Process for production of 6α,9α-difluoro-11β,17α-dihydroxy-16α-methyl-4-pregnene-3,20-dione and its derivatives. 4,898,693, Cl. 260-397.400.

Henderson, Mark: *See*—
Kallman, Robert A.; and Henderson, Mark, 4,897,891, Cl. 5-493.000.

Hendrick, Kendall B.; and Reader, John R., Jr., to Du Pont de Nemours, E. I., and Company. Electrode system for a parallel plate dielectric analyzer. 4,899,102, Cl. 324-663.000.

Hendricks, Debra S. Protective fan shield. 4,898,516, Cl. 416-247.00R.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Bitter, Ingrid; Scholz, Wolfhard; and Schneider, Werner, 4,898,690, Cl. 252-554.000.
Hoeffkes, Horst; Seidel, Kurt; Giede, Karl; Struve, Alfred; and Gruber, Bert, 4,898,725, Cl. 424-70.000.
Pruehs, Horst; Schenker, Gilbert; Altenschoepfer, Theodor; and Piorr, Robert, 4,898,621, Cl. 134-25.200.

Hennessy, Bernard M.: *See*—
Baggiolini, Enrico G.; Hennessy, Bernard M.; and Uskokovic, Milan R., 4,898,855, Cl. 514-167.000.

Henning, Roy A.: *See*—
Lai, N. C. Joseph; Zuperku, Edward J.; and Henning, Roy A., 4,899,053, Cl. 250-343.000.

Henriksson, Ragnar, to Asea Stal AB. Method of attaching tubes in a tube plate in a heat exchanger. 4,897,908, Cl. 29-890.440.

Heraeus Quarzschmelze GmbH: *See*—
Sauerwein, Paul, 4,898,604, Cl. 65-18.100.

Herbermann, Alfred F.; and Carabbio, Robert M., to Syron Engineering and Manufacturing Corporation. Structure formed from ball jointed links. 4,898,490, Cl. 403-56.000.

Herbst, David H.; and Boes, Chris E., to Imperial Cup Corporation. Push and drink lid. 4,898,299, Cl. 220-90.400.

Herold, Peter; and Angst, Christof, to Ciba-Geigy Corporation. Processes for the preparation of 5-amino-4-hydroxyvaleric acid derivatives. 4,898,977, Cl. 564-191.000.

Herrmann, Rainer; and Funken, Dieter, to Endress u. Hauser GmbH u. Co. Arrangement for measuring the water vapor dew point in gases. 4,898,476, Cl. 374-28.000.

Herrmann, Wilfried: *See*—
Stobbe, Anatoli; and Herrmann, Wilfried, 4,899,132, Cl. 340-551.000.

Herron, Lee F.: *See*—
Bender, James G.; Herron, Lee F.; and Struthers, Keith D., 4,898,361, Cl. 251-129.050.

Hershberger, Charles L.; Larson, Jeffrey L.; and Reynolds, Patricia A., to Eli Lilly and Company. Ultrahigh copy number streptomycetes plasmids. 4,898,828, Cl. 435-252.300.

Hertel, Richard J.: *See*—
Freytsis, Avrum; Hertel, Richard J.; and Mears, Eric L., 4,899,059, Cl. 250-492.200.

Heublein, Inc.: *See*—
Shrikhande, Anil J.; and Alioto, Joseph A., 4,898,742, Cl. 426-271.000.

Hewlett Packard Company: *See*—
Ogura, Mitsuhiro, 4,899,106, Cl. 324-158.00F.

Heyneker, Herbert L.: *See*—
Goeddel, David V.; and Heyneker, Herbert L., 4,898,830, Cl. 435-320.000.

Hi-Shear Corporation: *See*—
Kramer, David M., 4,899,045, Cl. 250-227.000.

Higgen, Hans-Hermann: *See*—
Maelzer, Martin; Dehmel, Rudiger; Higgen, Hans-Hermann; and Gulzow, Andreas, 4,899,104, Cl. 324-158.00F.

Higuchi, Masao: *See*—
Fujita, Michiru; and Higuchi, Masao, 4,899,108, Cl. 324-318.000.

Hijikata, Toshiki: *See*—
Yano, Seiki; and Hijikata, Toshiki, 4,899,359, Cl. 372-44.000.

Hiki, Susumu: *See*—
Takano, Masayuki; Hiki, Susumu; and Kikuti, Yuusiti, 4,898,177, Cl. 128-662.030.

Hikita, Makoto: *See*—
Tamamura, Toshiaki; Katsuta; Niwa, Osamu; Hikita, Makoto; and Sugita, Akio, 4,898,766, Cl. 428-195.000.

Hille, Arvin A., to Blount, Inc. Low vibration center drive cutter chain. 4,898,057, Cl. 83-831.000.

Hilti Aktiengesellschaft: *See*—
Froehlich, Peter, 4,898,505, Cl. 411-55.000.
Neumaier, Anton; Plank, Uto; and Rumpp, Gerhard, 4,898,250, Cl. 173-48.000.

Hilty, Terrence K., to Dow Corning Corporation. Method to prepare thermo-oxidatively stable phenylmethylsiloxane fluids. 4,898,956, Cl. 556-401.000.

Himes, Glenn R.: *See*—
Sanders, Andrea; and Himes, Glenn R., 4,898,784, Cl. 428-412.000.

Hinchcliffe, Dennis; Labbe, Francis A. M.; Molins, Desmond W.; and Wiese, Paul R., to Molins PLC. Cigarette manufacture. 4,898,187, Cl. 131-284.000.

Hinckley, Roger L., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Optical fiber connector. 4,898,446, Cl. 350-96.200.

Hineno, Kazuhiro: *See*—
Kamioka, Yosio; Hineno, Kazuhiro; and Kanazawa, Tuneo, 4,898,268, Cl. 198-345.000.

Hippocrates, Exarchou. Motor, pump and flow meter with a planetary system. 4,898,525, Cl. 418-227.000.

Hirabayashi, Keiji: *See*—
Sugata, Masao; Den, Tohru; Ito, Susumu; Hirabayashi, Keiji; Ikoma, Keiko; Kurihara, Noriko; Osabe, Kuniji; Takeuchi, Tatsuo; Satomura, Hiroshi; Oguchi, Yoshihiro; Maruyama, Akio; and Saito, Keishi, 4,898,798, Cl. 430-58.000.

Hirabayashi, Tsugio; and Hamanaka, Izumi, to Konica Corporation. Copy paper processing apparatus. 4,898,372, Cl. 270-53.000.

Hirai, Masato, to Hitachi, Ltd. Time division multiplexer with automatic call function. 4,899,337, Cl. 370-80.000.

Hirai, Yoshikatsu: *See*—
Nakai, Satoru; Kaneta, Mayumi; Kikumoto, Yoshikazu; Hong, Yeong-Man; Kawai, Kazuyoshi; Takegata, Setsuko; Ishii, Kiyoshi; Yanagihara, Yasuo; and Hirai, Yoshikatsu, 4,898,818, Cl. 435-69.100.

Hiramitsu, Tetsushi: *See*—
Ohno, Satoshi; and Hiramitsu, Tetsushi, 4,899,020, Cl. 174-68.500.

Hirano, Tetsuji: *See*—
Inoue, Hiroshi; Muramatsu, Tadao; Narahara, Yasuji; and Hirano, Tetsuji, 4,898,753, Cl. 427-276.000.
Hirata, Mitsuteru: *See*—
Fujii, Setsuro; Hattori, Eizou; Hirata, Mitsuteru; Watanabe, Koichiro; Onogi, Kazuhiro; and Nagakura, Masahiko, 4,898,876, Cl. 544-391.000.
Hirata, Shinji; and Horinishi, Katsumi, to West Electric Company Ltd.; and Canon, Inc. Electroluminescence light emission apparatus. 4,899,086, Cl. 315-169.300.
Hirayama, Koji: *See*—
Aiyama, Fumihiko; and Hirayama, Koji, 4,898,039, Cl. 74-6.000.
Hirota, Takato: *See*—
Ohtake, Shigeaki; Kogawa, Kuniyuki; and Hirota, Takato, 4,899,120, Cl. 335-132.000.
Hishinuma, Kazuhiro, to Fuji Photo Film Co., Ltd. Radiation image read-out apparatus. 4,899,049, Cl. 250-327.200.
Hitachi, Ltd.: *See*—
Aoyagi, Yuuji; Yokoyama, Syouji; and Yanagita, Tomohiko, 4,898,484, Cl. 400-120.000.
Hirai, Masato, 4,899,337, Cl. 370-80.000.
Imai, Tsutomu; and Sengoku, Norio, 4,899,251, Cl. 361-346.000.
Kano, Kiyoshi; Kaku, Nobuyuki; Osawa, Atsuo; Fujimori, Shinya; and Fukagawa, Yoshihiro, 4,899,235, Cl. 360-85.000.
Kuroda, Michio; Sato, Isao; Ishibashi, Yoji; Uchiyama, Yoshihiro; Ohmori, Takashi; Akatsu, Shigeyuki; Kato, Fumio; Segawa, Yorihide; and Iizuka, Nobuyuki, 4,898,001, Cl. 60-733.000.
Miyamoto, Kazuhisa; Miyaoka, Shuuichi; and Odaka, Masanori, 4,899,314, Cl. 365-226.000.
Morishita, Koichi; Yokoyama, Tetsuo; and Sato, Kazuhiro, 4,899,393, Cl. 382-6.000.
Nakayashiki, Susumu; Kashio, Jiro; Harakawa, Takeshi; Bekki, Yoshinori; and Yamaga, Mitsuhiro, 4,899,142, Cl. 340-825.050.
Ochiai, Izumi; Miyagi, Masahiro; Nozawa, Yoshio; and Kitayama, Yukio, deceased, 4,898,232, Cl. 165-151.000.
Okuyama, Kousuke, 4,898,840, Cl. 437-41.000.
Omoda, Koichiro; Miyamoto, Shunsuke; Nakagawa, Takayuki; Takamine, Yoshio; Nagashima, Shigeo; Miyoshi, Masayuki; Kazama, Yoshiharu; and Kinoshita, Yoshiaki, 4,899,273, Cl. 364-200.000.
Onari, Mikihiko; Sekozawa, Teruji; and Funabashi, Motohisa, 4,899,280, Cl. 364-431.050.
Sakurai, Kazuo; and Tamura, Takahiro, 4,898,521, Cl. 418-55.000.
Sato, Katsuyuki, 4,899,312, Cl. 365-230.090.
Stormberg, Hans-Peter; and Watanabe, Yoshio, 4,899,355, Cl. 378-34.000.
Hitachi Medical Corporation: *See*—
Morishita, Koichi; Yokoyama, Tetsuo; and Sato, Kazuhiro, 4,899,393, Cl. 382-6.000.
Hitachi Video Engineering, Inc.: *See*—
Kano, Kiyoshi; Kaku, Nobuyuki; Osawa, Atsuo; Fujimori, Shinya; and Fukagawa, Yoshihiro, 4,899,235, Cl. 360-85.000.
Hite, William H.; and Allebach, Gene E., to National Machinery Company, The. Quick-change tooling for progressive formers and the like. 4,898,017, Cl. 72-405.000.
Hitoshio, Akio; Takamatsu, Hisao; and Hattori, Reiko, to Showa Denko Kabushiki Kaisha. Process for production of isomaltulose. 4,898,820, Cl. 435-95.000.
Ho, Vu Q., to Northern Telecom Limited. Method of filling contact holes for semiconductor devices and contact structures made by that method. 4,898,841, Cl. 437-200.000.
Hodgkins, David H.; and Shinkevich, Alex, to Stanadyne Automotive Corp. Fuel filter with heater. 4,898,668, Cl. 210-180.000.
Hoechst AG: *See*—
Stankowiak, Achim; and Schulz, Hildegard, 4,898,992, Cl. 568-618.000.
Hoechst Aktiengesellschaft: *See*—
Bergmann, Andreas; Bartmann, Wilhelm; Beck, Gerhard; and Lau, Hans-Hermann, 4,898,868, Cl. 514-277.000.
Erpenbach, Heinz; Gehrmann, Klaus; Horstermann, Peter; Jagers, Erhard; and Kohl, Georg, 4,898,966, Cl. 560-38.000.
Muchnik, Boris J.; and Fischer, Bernd F., 4,898,529, Cl. 425-542.000.
Schlafer, Ludwig; Springer, Hartmut; and Hahnle, Reinhard, 4,898,933, Cl. 534-605.000.
Schwaiger, Gunther; Springer, Hartmut; and Helmling, Walter, 4,898,944, Cl. 544-337.000.
Voigt, Hartmut; and Freudenreich, Reinhold, 4,898,645, Cl. 203-67.000.
Hoechst Celanese Coproration: *See*—
Swofford, Howard W., 4,898,786, Cl. 428-480.000.
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Borzo, Marie; and Stuetz, Dagobert E., 4,898,691, Cl. 252-589.000.
Buckley, Alan; Che, Tessie M.; Leslie, Thomas M.; Stamatoff, James B.; Stuetz, Dagobert E.; and Ulrich, Donald R., 4,898,454, Cl. 350-350.00R.
Che, Tessie M.; Stuetz, Dagobert E.; Buckley, Alan; and Ulrich, Donald R., 4,898,755, Cl. 427-389.700.
Chenevey, Edward C.; and Kafchinski, Edward R., 4,898,924, Cl. 528-183.000.
Collins, George L.; Wissbrun, Kurt F.; and Kim, Hongkyu, 4,898,925, Cl. 528-230.000.
Gupta, Balaram B. G., 4,898,916, Cl. 525-344.000.
Sansone, Michael J., 4,898,917, Cl. 525-420.000.
Hoeffkes, Horst; Seidel, Kurt; Giede, Karl; Struve, Alfred; and Gruber, Bert, to Henkel Kommanditgesellschaft auf Aktien. Preparations for washing or rinsing hair containing di- or tri- carboxylic acids. 4,898,725, Cl. 424-70.000.
Hoekstra, George P.; Sood, Lal C.; and Alexander, Samuel E., to Motorola, Inc. Bit line precharge in a bimos ram. 4,899,317, Cl. 365-203.000.
Hofer, Peter: *See*—
Miller, Ronald B.; Halpern, Alfred; Leslie, Stewart; and Hofer, Peter, 4,898,729, Cl. 424-80.000.
Hoffarth, Rainer. Device for displaying graphic information. 4,898,536, Cl. 434-114.000.
Hoffman-La Roche Inc.: *See*—
Baggiolini, Enrico G.; Hennessy, Bernard M.; and Uskokovic, Milan R., 4,898,855, Cl. 514-167.000.
Hoffman, Ronald W. Container stand. 4,898,352, Cl. 248-96.000.
Hoffmann-La Roche Inc.: *See*—
Buchecker, Richard; Germann, Alfred; Kelly, Stephen; and Schadt, Martin, 4,898,455, Cl. 350-350.00R.
Chan, Ka-kong; and Saucy, Gabriel G., 4,898,953, Cl. 549-408.000.
Chan, Ka-kong; and Saucy, Gabriel G., 4,898,962, Cl. 558-58.000.
Morgan, James I.; Spector, Sydney; and Wang, James K. T., 4,898,861, Cl. 514-221.000.
Hofmann, Hans; and Wendt, Hartmut, to Messerschmitt-Boelkow-Blohm GmbH. Method for bonding a porous metal layer to a cermet surface. 4,898,699, Cl. 264-43.000.
Hofmann, Peter: *See*—
Lueders, Harald; and Hofmann, Peter, 4,898,934, Cl. 536-18.600.
Hofmann, Robert F.; and Waldock, David B., to Duckworth & Kent Surgical Instruments Limited; and Medical Titanium Corporation. Surgical knife. 4,898,170, Cl. 606-166.000.
Hogenkamp, Wilhelm; and Wostbrock, Gert, to Otto Hansel GmbH. Wrapper for tubular products, especially chocolate bars and method of manufacturing it. 4,897,983, Cl. 53-461.000.
Hohenecker, Harald, to Aari Cine & Video Gerate Gesellschaft M.b.H. Macrolens assembly having a distance adjustment of more than 360 degrees. 4,898,453, Cl. 350-255.000.
Holcblat, Alain, to Framatome. Water cleansing tank for steam generator. 4,898,123, Cl. 122-379.000.
Holcombe, Cressie E., Jr.; and Chapman, Lloyd R., to ZTP Coatings. Paintable composition for protecting metals and ceramics during thermal treatment. 4,898,618, Cl. 106-287.340.
Holik, Herbert: *See*—
Weisshuhn, Elmer; Bubik, Alfred; Dahl, Hans; Holik, Herbert; Kurtz, Rudiger; Zembrot, Anton; Stotz, Wolf-Gunter; Seider, Werner; and Trondle, Robert, 4,898,643, Cl. 162-259.000.
Holland, William D.: *See*—
Leone, David A.; Moody, G. Lawrence; Holland, William D.; Bell, Mark E.; and Robbins, W. Dale, 4,899,022, Cl. 200-50.00A.
Hollandse Signaalapparaten B.V.: *See*—
Buikema, Wolter, 4,899,113, Cl. 328-258.000.
Holler, Tod P.: *See*—
Shapiro, Bennett M.; Turner, Eric E.; Hopkins, Paul B.; Klevit, Rachel E.; Holler, Tod P.; and Spaltenstein, Andreas, 4,898,878, Cl. 514-386.000.
Hollinger, Theodore G., to APC-Onsite, Inc. Frequency-dependent single-phase to three-phase AC power conversion. 4,899,268, Cl. 363-4.000.
Hollingsworth, Walter H.: *See*—
Sachs, Howard G.; Cho, James Y.; and Hollingsworth, Walter H., 4,899,275, Cl. 364-200.000.
Hollweck, Walter, to Thermostat-und Schaltgeraetebau GmbH & Co. KG. Thermally controlled electric switch. 4,899,124, Cl. 337-299.000.
Holmes, Michael, to Lucas Industries public limited company. Method and apparatus for controlling an internal combustion engine. 4,899,282, Cl. 364-431.080.
Holmwood, Graham: *See*—
Buchel, Karl H.; Holmwood, Graham; Kraatz, Udo; Kramer, Wolfgang; Reinecke, Paul; Brandes, Wilhelm; and Stendel, Wilhelm, 4,898,875, Cl. 514-383.000.
Holoubek, George H.; Rhoades, John J.; and Whitaker, George P., to Wheeling Stamping Company. Method for shaping closed bottom of tubular container. 4,898,708, Cl. 264-515.000.
Holtje, Bruce E., to Imagitek, Inc. Feed device with automatic sheet alignment. 4,898,375, Cl. 271-246.000.
Hon, Clarence C., to Mobil Oil Corp. Circulating water system and sump pump strainer apparatus. 4,898,513, Cl. 415-121.200.
Honda Giken Kogyo K. K.: *See*—
Fujimoto, Sachito; and Sugino, Takuya, 4,898,143, Cl. 123-571.000.
Honda Giken Kogyo K.K.: *See*—
Sanada, Makoto; Yamashita, Hiroshi; Izawa, Shinichiro; and Hamamoto, Toshikazu, 4,898,131, Cl. 123-90.440.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Kenmochi, Toshihisa; and Nakamura, Tatsunori, 4,898,419, Cl. 296-204.000.
Kurihara, Junichi; and Hara, Masanori, 4,898,764, Cl. 428-188.000.
Honda, Keiji: *See*—
Nakamura, Naohiro; Mori, Yoshikatsu; and Honda, Keiji, 4,898,500, Cl. 407-62.000.
Honda, Shuichi: *See*—
Ichikawa, Toru; Kodama, Shuichi; Kagoroku, Nobuo; Ito, Shotaro; and Honda, Shuichi, 4,898,003, Cl. 62-244.000.
Honda, Yoshihiro: *See*—
Masuoka, Shigeru; Doi, Hiroshi; and Honda, Yoshihiro, 4,898,895, Cl. 523-122.000.
Honeywell Inc.: *See*—
Black, Robert A., Jr.; and Kompelien, Arlon D., 4,899,088, Cl. 315-291.000.

Braun, Steve W., 4,898,565, Cl. 455-612.000.
Dawson, John F.; and Ronish, Edward W., 4,899,293, Cl. 364-521.000.
Dunaway, Thomas J.; Spielberger, Richard K.; and Dicks, Lori A., 4,898,320, Cl. 228-245.000.
Jordan, Norman M.; and McLaughlin, Donald, 4,898,097, Cl. 102-283.000.
Jungkman, David L.; Comey, David M.; Stern, Ronald D.; and Musicant, Bruce L., 4,898,435, Cl. 350-1.100.

Hong, Yeong-Man: *See*—
Nakai, Satoru; Kaneta, Mayumi; Kikumoto, Yoshikazu; Hong, Yeong-Man; Kawai, Kazuyoshi; Takegata, Setsuko; Ishii, Kiyoshi; Yanagihara, Yasuo; and Hirai, Yoshikatsu, 4,898,818, Cl. 435-69.100.

Honjou, Toshio: *See*—
Tachibana, Hidekiyo; Noda, Akihiko; Terao, Kazuo; Honjou, Toshio; Seki, Yukio; Endo, Hiroshi; and Yokobari, Toshio, 4,898,801, Cl. 430-106.600.

Hoots, John E.: *See*—
Johnson, Donald A.; Hoots, John E.; Fong, Dodd W.; and Crucil, Guy A., 4,898,686, Cl. 252-389.200.

Hoover, John W.; and Marracino, Charles R., to Nidec Corporation. Molded printed circuit board for use with a brushless electric motor. 4,898,759, Cl. 428-99.000.

Hopkins, Larry K.; Fischer, Gregory J.; and Green, David G., to Golden Aluminum Company. Apparatus for aligning and transporting containers. 4,898,270, Cl. 198-396.000.

Hopkins, Paul B.: *See*—
Shapiro, Bennett M.; Turner, Eric E.; Hopkins, Paul B.; Klevit, Rachel E.; Holler, Tod P.; and Spaltenstein, Andreas, 4,898,878, Cl. 514-386.000.

Horaguchi, Yoichi; Tomizawa, Takashi; Hayashi, Shigeyuki; Ohno, Motoshi; and Nakata, Takashi, to Brother Kogyo Kabushiki Kaisha. Image recording apparatus having adjustable optical system. 4,899,193, Cl. 355-55.000.

Hori, Hisamitsu, to Fuji Photo Film Co., Ltd. Method of and device for detecting image. 4,899,194, Cl. 355-56.000.

Horii, Satoshi; and Fukase, Hiroshi, to Takeda Chemical Industries, Ltd. Inosose derivatives, production and use thereof. 4,898,986, Cl. 568-376.000.

Horikoshi, Yukio: *See*—
Sakamaki, Hiroshi; Horikoshi, Yukio; and Jinnouchi, Takeshi, 4,898,526, Cl. 418-257.000.

Horinishi, Katsumi: *See*—
Hirata, Shinji; and Horinishi, Katsumi, 4,899,086, Cl. 315-169.300.

Horn, Petr, to Novasina AG. Apparatus and method for the measuring of dew points. 4,898,475, Cl. 374-28.000.

Horowitz, Carl; Sanduja, Mohan; and Dichter, Michael, deceased (by Dichter, Anna, heir), to Puro Corporation of America. Bacteriostatic activated carbon filter. 4,898,676, Cl. 210-668.000.

Horowitz, Fred: *See*—
Lesser, Norman; and Horowitz, Fred, 4,898,088, Cl. 98-49.000.

Horrobin, David F., to Efamol Limited. Pharmaceutica and dietary compositions. 4,898,885, Cl. 514-560.000.

Horsch, Joachim, to J. I. Case Company. Hydraulically actuated indexing mechanism. 4,898,075, Cl. 91-477.000.

Horstermann, Peter: *See*—
Erpenbach, Heinz; Gehrmann, Klaus; Horstermann, Peter; Jagers, Erhard; and Kohl, Georg, 4,898,966, Cl. 560-38.000.

Horton, Roger L., to Davidson Textron Inc. Rotational slush molding method. 4,898,697, Cl. 264-37.000.

Hoshin Kagaku Sangyosho Co., Ltd.: *See*—
Koji, Masashi, 4,899,057, Cl. 250-436.000.

Hoshino Gakki Co., Ltd.: *See*—
Hoshino, Yoshihiro, 4,898,062, Cl. 84-422.300.

Hoshino, Masahiro; Kobayashi, Isao; Seko, Kenji; Iwasawa, Naozumi; Akaki, Yuu; and Kondo, Toshio, to Kansai Paint Co., Ltd.; and Mitsubishi Denki Kabushiki Kaisha. Electrodeposition coating process of photoresist for printed circuit board. 4,898,656, Cl. 204-181.100.

Hoshino, Yoshihiro, to Hoshino Gakki Co., Ltd. High hat stand with a rotary member. 4,898,062, Cl. 84-422.300.

Hosoda, Yoshikazu: *See*—
Onouchi, Takashi; Sugai, Hironori; Sekiguchi, Kazuo; Hosoda, Yoshikazu; and Yoshida, Eiichi, 4,898,781, Cl. 428-402.220.

Hosokawa, Yasutoshi: *See*—
Yumoto, Hideaki; Yonemura, Masao; Nagase, Mamoru; Yamada, Yoshito; Fujiwara, Yoshiyasu; Okamoto, Masakatsu; and Hosokawa, Yasutoshi, 4,898,022, Cl. 73-46.000.

Hosoya, Tsuguharu, to Nihon Kohden Corporation. Structure for installing a recording pen. 4,899,177, Cl. 346-139.00R.

Hosten, Daniel, to Siemens Aktiengesellschaft. Electroplating apparatus for plate-shaped workpieces. 4,898,657, Cl. 204-198.000.

Hotchkiss, Robert L.: *See*—
McCullough, Francis P., Jr.; Hotchkiss, Robert L.; Snelgrove, R. Vernon; Hall, David M.; and McCullough, Jacqueline R., 4,898,783, Cl. 428-408.000.

Houston, David L. Press brake deflection compensating device. 4,898,015, Cl. 72-389.000.

Houston, Theodore W., to Texas Instruments Incorporated. Low-power, noise-resistant read-only memory. 4,899,315, Cl. 365-230.060.

Hovakeemian, George: *See*—
Lahalih, Shawqui; and Hovakeemian, George, 4,898,908, Cl. 524-593.000.

Hove, Robert G., to Boeing Company, The. Apparatus and method for adaptive amplitude equalization. 4,899,365, Cl. 375-13.000.

Howa Machinery, Ltd.: *See*—
Kogiso, Takashi; and Kurachi, Yoshio, 4,897,992, Cl. 57-281.000.

Hrivnak, John E.: *See*—
Wells, Hoyt M.; Determan, William J.; Vanis, Vernon V.; Hrivnak, John E.; Richeson, Donald E.; and Saupe, Timothy P., 4,898,703, Cl. 264-166.000.

Hsia, Chung H.; Owen, Hartley; and Wright, Bernard S., to Mobil Oil Corporation. Olefin fractionation and catalytic conversion system. 4,898,716, Cl. 422-190.000.

Hsia, Chung H.; Owen, Hartley; and Wright, Bernard S., to Mobil Oil Corp. Multistage process for converting oxygenates to distillate hydrocarbons with interstage ethene recovery. 4,898,717, Cl. 422-190.000.

Hsiao, Jennifer B.: *See*—
Beard, Marian H.; Caro, Perry A.; Hsiao, Jennifer B.; Mackey, Kevin J.; Sandman, James G., Jr.; Steinbach, Gary R.; and Woods, Donald R., 4,899,136, Cl. 340-706.000.

Hsieh, Bing R.; Gruber, Robert J.; and Haack, John L., to Xerox Corporation. Toner compositions with organo boron negative charge enhancing additives. 4,898,802, Cl. 430-110.000.

Huang, Hsu-Nan, to Du Pont de Nemours, E. I., and Company. New perfluoropolyethers. 4,898,991, Cl. 568-615.000.

Hubbard, Elbert M.: *See*—
Luebke, Clement J.; Slade, Frank A.; Sank, Gerald W.; Grob, James T.; Price, George M.; and Hubbard, Elbert M., 4,898,151, Cl. 126-391.000.

Hubbard, Lloyd C.; and Clausen, Earl W., to Minnesota Mining & Manufacturing Company. Shaft driven disposable centrifugal pump. 4,898,518, Cl. 417-360.000.

Hubbard, Robert F.; and Jacobs, Joseph M., to Hughes Aircraft Company. Pickup device. 4,898,416, Cl. 294-119.100.

Hubbell Incorporated: *See*—
Jorgensen, Robert W.; and Schnell, Kenneth R., 4,898,357, Cl. 248-906.000.
Raudabaugh, Donald E., 4,899,248, Cl. 361-127.000.

Huber, Ludwig K.: *See*—
Reilly, James L.; Huber, Ludwig K.; and Leader, Gordon R., 4,899,249, Cl. 361-317.000.

Huels Aktiengesellschaft: *See*—
Bellut, Hans, 4,898,984, Cl. 568-342.000.
Lueders, Harald; and Hofmann, Peter, 4,898,934, Cl. 536-18.600.

Huggett, Richard D. J.: *See*—
Shuker, Brian; and Huggett, Richard D. J., 4,898,364, Cl. 254-342.000.

Huggins, Raymond W.: *See*—
Falk, Robert A.; and Huggins, Raymond W., 4,899,042, Cl. 250-227.000.

Hughes Aircraft Company: *See*—
Burt, Donald W.; and Hans, Gerald A., 4,898,711, Cl. 419-27.000.
Hubbard, Robert F.; and Jacobs, Joseph M., 4,898,416, Cl. 294-119.100.
Polinski, Paul W., Sr., 4,899,118, Cl. 333-246.000.

Hughes, Philip F.; Mobilio, Dominick; and Humber, Leslie G., to American Home Products Corp. Process for the production of substituted 2-oxocyclohexaneacetic acid esters. 4,898,967, Cl. 560-051.000.

Hulland, Burton L.: *See*—
Litchford, George B.; and Hulland, Burton L., 4,899,156, Cl. 342-37.000.

Hulshoff, Hartmut; Kothe, Peter; Luft, Michael; and Schutz, Ulrich, to Quick-Rotan Elektromotoren GmbH. Processor for sewing machines. 4,899,287, Cl. 364-470.000.

Hultman, Sheryl L.: *See*—
Fong, Gerald D.; and Hultman, Sheryl L., 4,898,767, Cl. 428-210.000.

Humber, Leslie G.: *See*—
Hughes, Philip F.; Mobilio, Dominick; and Humber, Leslie G., 4,898,967, Cl. 560-051.000.

Humphrey, Brian D.; Kasner, Marc L.; and Isidor, John L., to Montclair State College. Conducting polymer films, method of manufacture and applications therefor. 4,898,921, Cl. 527-300.000.

Hung, Po-Chieh: *See*—
Morita, Hideki; Sugawara, Kazuhiro; Hung, Po-Chieh; Hara, Hirotaka; Nakamura, Tadashi; Kobayashi, Kazuyuki; Azuma, Masashi; and Katsuta, Tsuyoshi, 4,899,215, Cl. 358-78.000.

Hunter, Edwin J.; and Scott, Loren W., to Hunter, Edwin J. Adjustable rotary stream sprinkler unit. 4,898,332, Cl. 239-240.000.

Hunter Engineering Company: *See*—
Altnether, Paul J.; and Strege, Timothy A., 4,897,926, Cl. 33-203.140.

Huntt, Robert L., to Alpha Industries. Apparatus and process for firing ceramics. 4,898,534, Cl. 432-250.000.

Hunziker, Max, to Ciba-Geigy Corporation. Non-fusible polymer insoluble in organic solvents from 1,3,5,7-tetrathia-s-indacene-2,6-dithione. 4,898,927, Cl. 528-377.000.

Hussmann, Gregory P., to Amoco Corporation. Preparation of diaryl ethers and diaryl sulfides. 4,898,982, Cl. 568-58.000.

Hutchison, Alan J.; Shaw, Kenneth R.; and Schneider, Josef A., to Ciba-Geigy Corporation. Certain 2-carboxypiperidyl-(alkylene or alkenylene)-phosphonic acids and esters thereof useful for the treatment of disorders responsive to n-methyl-d-aspartate receptor blockade. 4,898,854, Cl. 514-89.000.

Hutt, Heinz. Inflatable grinding roller. 4,897,968, Cl. 51-373.000.

Hutta, Joseph J., to United States of America, Air Force. Method for manufacturing halide glass optical fiber. 4,898,603, Cl. 65-3.130.

Hutter, Horst: *See*—
Ernert, Klaus; and Hutter, Horst, 4,898,096, Cl. 102-221.000.

Hvalso, Kurt: *See*—
Grobè, Finn; Hvalso, Kurt; and Madsen, Benni, 4,898,056, Cl. 83-689.000.
Hwang, Harrison. Cassette tape holding box and dispenser. 4,898,312, Cl. 225-26.000.
Hyche, Kenneth W.; and Gose, William C., to Eastman Kodak Company. Aqueous additive systems, methods and polymeric particles. 4,898,616, Cl. 106-271.000.
Hydro-Quebec: *See*—
Gauthier, Michel; and Belanger, Andre, 4,897,917, Cl. 29-623.300.
Ibe, Hiroyuki: *See*—
Shibagaki, Taro; Atsumi, Takehiko; Ibe, Hiroyuki; and Tanikoshi, Sadao, 4,899,339, Cl. 370-102.000.
Ichikawa, Masako; and Mitome, Yukio, to NEC Corporation. Device for deciding pole-zero parameters approximating spectrum of an input signal. 4,899,386, Cl. 381-43.000.
Ichikawa, Toru; Kodama, Shuichi; Kagoroku, Nobuo; Ito, Shotaro; and Honda, Shuichi, to Matsushita Electric Industrial Co., Ltd. Automobile air conditioner. 4,898,003, Cl. 62-244.000.
Ichikawa, Tsutomu: *See*—
Tsuji, Kenji; and Ichikawa, Tsutomu, 4,899,092, Cl. 313-594.000.
Ichiro, Yamawaki: *See*—
Kazuo, Ogawa; Ichiro, Yamawaki; Yoichi, Matsushita; Naruo, Nomura; and Issei, Okazaki, 4,898,867, Cl. 514-258.000.
ICI Americas Inc.: *See*—
Brown, Frederick J.; and Yee, Ying K., 4,898,863, Cl. 514-235.200.
Lee, David L., 4,898,973, Cl. 562-429.000.
IDB Corporation: *See*—
Sherritt, Jay G., 4,899,230, Cl. 360-15.000.
Igarashi, Tomoharu; Yokote, Yoshiniro; and Yamamoto, Kazuo, to Nippon Seiko Kabushiki Kaisha. Structure for fixing anchor base on stationary base of vehicle. 4,898,402, Cl. 280-804.000.
Igata, Akitosi; and Mikoda, Tamio, to Mitsui Toatsu Chemicals, Incorporated. Pyridone dyestuff for thermal transfer recording and printing sheets and methods employing same. 4,898,850, Cl. 503-227.000.
Iguchi, Masaaki: *See*—
Ogihara, Masahiro; Makikawa, Shinji; and Iguchi, Masaaki, 4,898,641, Cl. 156-601.000.
Iida Industry Co., Ltd.: *See*—
Kitoh, Osamu; and Ohashi, Masahiko, 4,898,630, Cl. 156-79.000.
Iizuka, Akira, to Yamaha Corporation. Electronic musical instrument which compares amount of data recorded in internal memory device with storage capacity of external memory device and selectively transfers data thereto. 4,898,059, Cl. 84-601.000.
Iizuka, Nobuyuki: *See*—
Kuroda, Michio; Sato, Isao; Ishibashi, Yoji; Uchiyama, Yoshihiro; Ohmori, Takashi; Akatsu, Shigeyuki; Kato, Fumio; Segawa, Yorihide; and Iizuka, Nobuyuki, 4,898,001, Cl. 60-733.000.
Iizuka, Taiji, to Sharp Kabushiki Kaisha. Electronic typewriter equipped with a personal computer. 4,898,483, Cl. 400-61.000.
Iizuka, Yunosuke; Ishii, Takashi; Mukawa, Yoshihiro; Nagata, Kouji; Matsumoto, Yoshitaka; and Murakami, Osamu, to Shimizu Construction Co., Ltd.; and Core Inc. Bore hole scanner with position detecting device and light polarizers. 4,899,277, Cl. 364-422.000.
Ikada, Yoshito; Suong, Hyu H.; Shimizu, Yoshihiko; Watanabe, Satoshi; Nakamura, Tatsuo; Suzuki, Masakazu; and Shimamoto, Takeshi, to Gunze Limited. Osteosynthetic pin. 4,898,186, Cl. 606-62.000.
Ikebe, Masaru: *See*—
Hashizume, Kenji; Ikebe, Masaru; Okamura, Masatoshi; and Shiba, Haruo, 4,899,242, Cl. 360-132.000.
Ikeda Bussan Co., Ltd.: *See*—
Kudo, Hiroaki, 4,898,417, Cl. 296-97.230.
Ikeda, Keiichi: *See*—
Ogura, Tokihiko; Mizoguchi, Yoshiyuki; Ikeda, Keiichi; and Taguchi, Tomishige, 4,899,171, Cl. 346-76.0PH.
Ikehata, Motoshige: *See*—
Odajima, Katsuhiko; and Ikehata, Motoshige, 4,898,200, Cl. 137-85.000.
Ikoma, Keiko: *See*—
Sugata, Masao; Den, Tohru; Ito, Susumu; Hirabayashi, Keiji; Ikoma, Keiko; Kurihara, Noriko; Osabe, Kuniji; Takeuchi, Tatsuo; Satomura, Hiroshi; Oguchi, Yoshihiro; Maruyama, Akio; and Saito, Keishi, 4,898,798, Cl. 430-58.000.
Imaeda, Toshihiko: *See*—
Ito, Shigeo; Imaeda, Toshihiko; Takagi, Ryuhei; and Sato, Ryutaro, 4,898,317, Cl. 228-41.000.
Image Storage/Retrieval Systems, Inc.: *See*—
Montagna, John A.; Irving, Gary; Farrell, Lee; Cross, Gerald; and Miller, Stephen A., 4,899,292, Cl. 364-521.000.
Imagitek, Inc.: *See*—
Holtje, Bruce E., 4,898,375, Cl. 271-246.000.
Vermaat, David L., 4,898,374, Cl. 271-178.000.
Imai, Tsutomu; and Sengoku, Norio, to Hitachi, Ltd. Power supply network of printed circuit board. 4,899,251, Cl. 361-346.000.
Imamura, Shigeru: *See*—
Kinoshita, Mitsuo; Imamura, Shigeru; and Matsueda, Hirokazu, 4,898,964, Cl. 558-416.000.
Kinoshita, Mitsuo; Imamura, Shigeru; and Matsueda, Hirokazu, 4,898,965, Cl. 558-416.000.
Imi-Tech Corporation: *See*—
Ferro, Gregory A., 4,898,763, Cl. 428-159.000.
Imperial Chemical Industries PLC: *See*—
Jones, Raymond V. H.; and Fleming, Ian G. C., 4,898,997, Cl. 570-128.000.
McDonald, Edward; and Salmon, Roger, 4,898,968, Cl. 560-124.000.
Imperial Cup Corporation: *See*—
Herbst, David H.; and Boes, Chris E., 4,898,299, Cl. 220-90.400.
IMT Radio Professionnelle: *See*—
Menestreau, Alain; Marchand, Maurice; Cornu, Alain; and Le Brun, Richard, 4,899,166, Cl. 343-873.000.
Inazawa, Yoshizumi: *See*—
Odaka, Kentaro; Ozaki, Shinya; Yamada, Masaki; Ishibashi, Hiroshi; and Inazawa, Yoshizumi, 4,899,232, Cl. 360-48.000.
Industrie Riunite SpA: *See*—
Morra, Luigi, 4,898,027, Cl. 73-118.100.
Infrared Fiber Systems: *See*—
Kindler, Edwin A.; and Tran, Danh C., 4,898,777, Cl. 428-364.000.
Innovatex Unternehemensberatung GmbH: *See*—
Rohner, Joachim, deceased; Langen, Manfred; and Gebald, Gregor, 4,897,991, Cl. 57-281.000.
Ino, Masayoshi, to Oki Electric Industry Co., Ltd. Semiconductor memory integrated circuit and process of fabricating the same. 4,899,203, Cl. 357-23.600.
Inoue, Hiroshi; Muramatsu, Tadao; Narahara, Yasuji; and Hirano, Tetsuji, to UBE Industries, Ltd. Process for the preparation of aromatic polyimide film. 4,898,753, Cl. 427-276.000.
Inoue, Motoichiro, to Ricoh Company, Ltd. Electrophotographic image forming apparatus. 4,899,182, Cl. 346-153.100.
Inoue, Yoshihisa; and Arai, Yasunori, to Nakamichi Corporation. Cartridge shutter actuating device in recording and/or reproducing apparatus. 4,899,238, Cl. 360-99.060.
Institut Francais Du Petrole: *See*—
Grehier, Alain; and Rojey, Alexandre, 4,898,233, Cl. 165-166.000.
Wittrisch, Christian, 4,898,237, Cl. 166-66.000.
Wittrisch, Christian, 4,898,240, Cl. 166-250.000.
Wittrisch, Christian, 4,898,241, Cl. 166-250.000.
Institut Pasteur: *See*—
Dodin, Andre; Siffert, Odile; Le Thuillier, Georgette; and Allard, Patrice, 4,898,815, Cl. 435-7.000.
Insul Company, Inc.: *See*—
Perri, Joseph A., 4,898,369, Cl. 266-266.000.
Intel Corporation: *See*—
Seifert, Willis, 4,898,058, Cl. 83-870.000.
Interatom GmbH: *See*—
Junghans, Ewald; and Tittizer, Gabriel, 4,898,129, Cl. 123-90.130.
Intergraph Corporation: *See*—
Sachs, Howard G.; Cho, James Y.; and Hollingsworth, Walter H., 4,899,275, Cl. 364-200.000.
International Business Machines Corporation: *See*—
Bates, Keith A.; Budd, Russell A.; Habegger, Millard A.; and Rhoades, Mark L., 4,899,327, Cl. 369-45.000.
Crouse, William G.; and Ware, Malcolm S., 4,899,384, Cl. 381-31.000.
David, Lawrence D., 4,898,842, Cl. 501-9.000.
Davis, Gordon T.; and Mandalia, Baiju D., 4,899,366, Cl. 375-14.000.
Dietsch, Hans E.; and Nestork, William J., 4,899,208, Cl. 357-74.000.
Easton, Colin J.; and Gay, Adrian C., 4,899,294, Cl. 364-522.000.
Hansen, Barry W.; and Romon, Raymond F., 4,899,274, Cl. 364-200.000.
Ledermann, Peter G.; and Nguyen, Luu Thanh, 4,898,117, Cl. 118-665.000.
MacPhail, Margaret G., 4,899,299, Cl. 364-570.000.
Mahmoud, Issa S., 4,898,651, Cl. 204-29.000.
Morin, Wilfred W., Jr.; and Wasser, Barry, 4,899,161, Cl. 342-451.000.
Stadler, Fred, 4,899,276, Cl. 364-300.000.
Stroh, Richard D., 4,898,314, Cl. 227-3.000.
International Minerals & Chemical Corp.: *See*—
DePrince, Randolph B.; and Viswanathan, Ravi, 4,898,733, Cl. 424-425.000.
International Rectifier Corporation: *See*—
Gould, Herbert J., 4,899,199, Cl. 387-15.000.
Inuiya, Masafumi: *See*—
Konishi, Masahiro; Inuiya, Masafumi; Muramatsu, Akira; and Kato, Masahiro, 4,899,213, Cl. 358-44.000.
Invitron Corporation: *See*—
Duffy, Stephen A.; Prior, Christopher P.; and Scott, Randal W., 4,898,826, Cl. 435-226.000.
Irie, Kazunori: *See*—
Nomura, Etsuzo; Takeuchi, Hirokazu; Suzuki, Shigeru; Irie, Kazunori; and Itoh, Hirosumi, 4,898,110, Cl. 112-314.000.
Iris Optics Ltd.: *See*—
Eriksson, Carl E., 4,898,459, Cl. 351-46.000.
Irvine, Robert: *See*—
Luperti, Harry E.; Irvine, Robert; and Luvara, Anthony, 4,898,570, Cl. 493-420.000.
Irving, Gary: *See*—
Montagna, John A.; Irving, Gary; Farrell, Lee; Cross, Gerald; and Miller, Stephen A., 4,899,292, Cl. 364-521.000.
Ishibashi, Genichi; Kamano, Hideyuki; and Seki, Masahiko, to Kawasaki Steel Corp. Apparatus for recovering high temperature blast furnace gas. 4,898,600, Cl. 55-222.000.
Ishibashi, Hiroshi: *See*—
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Kawai, Hiroyuki; and Ishihara, Kazuya, 4,899,127, Cl. 340-146.200.
Terase, Hideyuki; and Ishihara, Kazuya, 4,899,304, Cl. 364-745.000.

Ishii, Hidehiro: *See*—
Takeya, Noriyoshi; Ishii, Hidehiro; Watanabe, Osamu; Yoshio, Junichi; Katakami, Kazuhiko; and Izumo, Takeshi, 4,899,326, Cl. 369-36.000.

Ishii, Kiyoshi: *See*—
Nakai, Satoru; Kaneta, Mayumi; Kikumoto, Yoshikazu; Hong, Yeong-Man; Kawai, Kazuyoshi; Takegata, Setsuko; Ishii, Kiyoshi; Yanagihara, Yasuo; and Hirai, Yoshikatsu, 4,898,818, Cl. 435-69.100.

Ishii, Masaru; and Odawara, Kazuharu, to Kabushiki Kaisha Toshiba. Data reproducing apparatus and method for locking a reproducing head. 4,899,328, Cl. 369-77.200.

Ishii, Takashi: *See*—
Iizuka, Yunosuke; Ishii, Takashi; Mukawa, Yoshihiro; Nagata, Kouji; Matsumoto, Yoshitaka; and Murakami, Osamu, 4,899,277, Cl. 364-422.000.

Ishikawa Gasket Co., Ltd.: *See*—
Udagawa, Tsunekazu, 4,898,396, Cl. 277-235.00B.

Ishikawa, Hiroshi: *See*—
Fujii, Setsuro; Ishikawa, Hiroshi; Yasumura, Koichi; Jitsukawa, Koichiro; Toyama, Sachio; Tsubouchi, Hidetsugu; Sudo, Kimio; and Tsuji, Kouichi, 4,898,859, Cl. 514-210.000.

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Takewa, Hiroyuki; Serikawa, Mitsuhiko; Ishikawa, Seiichi; Usuki, Sawako; Kimura, Yoichi; and Obata, Shuichi, 4,899,390, Cl. 381-154.000.

Ishikura, Tsukasa; and Fukushima, Tatuharu, to Nippon Kayaku Kabushiki Kaisha. Process for producing 3-chloro-4-fluoronitrobenzene. 4,898,996, Cl. 568-938.000.

Ishimochi, Haruki; Yamamura, Kimio; Fukuyama, Yuji; Yanai, Masato; and Takahashi, Satoshi, to Sharp Kabushiki Kaisha. Display control device for superimposing data with a broad case signal on a television screen. 4,899,139, Cl. 340-721.000.

Ishimoto, Zenichi, to Nikko Co., Ltd. Direction converting device for a remote-controlled toy. 4,898,562, Cl. 446-460.000.

Ishizawa, Hiroaki: *See*—
Sasuga, Kazuyasu; Ishizawa, Hiroaki; Suzuki, Hisao; and Toho, Masato, 4,899,225, Cl. 358-448.000.

Isidor, John L.: *See*—
Humphrey, Brian D.; Kasner, Marc L.; and Isidor, John L., 4,898,921, Cl. 527-300.000.

Islas, John J. Drive linkage for reciprocating engine. 4,898,041, Cl. 74-44.000.

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Potter, David; Provost, Laurence N.; Baron, John M.; Stefanovic, David; Sharakan, Eric D.; Sheppard, David A.; and Isman, Marshall A., 4,899,342, Cl. 371-10.100.

Isobe, Yasuji, to Toagosei Chemical Industry Co. Adhesive composition. 4,898,899, Cl. 524-90.000.

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Ueyama, Satoshi; and Isoda, Satoru, 4,898,833, Cl. 436-63.000.

Isoda, Sumiro; Aibara, Shunzo; Miwa, Tamotsu; Fujiwara, Hiroyuki; Yokohama, Shuichi; and Matsumoto, Hiroo, to Daiichi Seiyaku Co., Ltd. Tricyclic triazolopyrimidine derivatives. 4,898,943, Cl. 544-251.000.

Isoi, Toshihiro: *See*—
Furukawa, Hiroshi; Uemichi, Sachio; Isoi, Toshihiro; and Kawakita, Kenzo, 4,898,796, Cl. 429-178.000.

Israel, Michael G.; Grozdits, George A.; and Trout, Kenneth G., to Jim Walter Reasearch Corp. Isocyanate/surfactant-modified polyol binder for manufacture of lignocellulosic composites. 4,898,776, Cl. 428-336.000.

Issei, Okazaki: *See*—
Kazuo, Ogawa; Ichiro, Yamawaki; Yoichi, Matsushita; Naruo, Nomura; and Issei, Okazaki, 4,898,867, Cl. 514-258.000.

Isuzu Motors Limited: *See*—
Sekiyama, Shigeo; Nihongi, Shigeru; and Mogami, Sadatoshi, 4,897,998, Cl. 60-614.000.

Itai, Kosaku, to Mitsubishi Denki Kabushiki Kaisha. Gas insulated switchgear with circuit breakers perpendicular to main buses. 4,899,250, Cl. 361-341.000.

Itani, Takashi: *See*—
Edakubo, Hiroo; Itani, Takashi; Narasawa, Takashi; Ushiro, Tatsuzo; Watanabe, Hiroshi; and Hasegawa, Masahide, 4,899,236, Cl. 360-95.000.

Itek Graphic Corp.: *See*—
Robbins, Daniel H.; Wirtz, John S.; Lein, Juergen; and Brookmire, Michael A., 4,899,214, Cl. 358-75.000.

Ito, Junya; Chiba, Akihiko; Oku, Masuo; and Komada, Hitoshi, to Sanyo Electric Co., Ltd. Tableware drying machine. 4,897,933, Cl. 34-58.000.

Ito, Kiyotaka, to Sanyo Electric Co., Ltd. Process for producing magnetic head of floating type. 4,897,915, Cl. 29-603.000.

Ito, Masazumi; Nishimori, Kadotaro; and Oyabu, Masaaki, to Minolta Camera Kabushiki Kaisha. Display device for copying machines and the like. 4,899,140, Cl. 340-756.000.

Ito, Nobuhiko; Kinoshita, Kimio; Suzuki, Kiyonori; and Eto, Takeaki, to Soda Aromatic Company, Limited. Process for preparing 3,5,5-trimethylcyclohexa-2-en-1,4-dione. 4,898,985, Cl. 568-344.000.

Ito, Shigeo; Imaeda, Toshihiko; Takagi, Ryuhei; and Sato, Ryutaro, to Daido Tokushuko Kabushiki Kaisha. Welding wire straightening device and welding torch. 4,898,317, Cl. 228-41.000.

Ito, Shotaro: *See*—
Ichikawa, Toru; Kodama, Shuichi; Kagoroku, Nobuo; Ito, Shotaro; and Honda, Shuichi, 4,898,003, Cl. 62-244.000.

Ito, Susumu: *See*—
Sugata, Masao; Den, Tohru; Ito, Susumu; Hirabayashi, Keiji; Ikoma, Keiko; Kurihara, Noriko; Osabe, Kuniji; Takeuchi, Tatsuo; Satomura, Hiroshi; Oguchi, Yoshihiro; Maruyama, Akio; and Saito, Keishi, 4,898,798, Cl. 430-58.000.

Ito, Toshiyuki: *See*—
Suto, Yoshinori; Ito, Toshiyuki; Nakajima, Hideyuki; Okamura, Keiichiro; Nayuki, Shin-ichi; Ogawa, Hiroyasu; and Enomoto, Harumitsu, 4,898,723, Cl. 423-447.400.

Ito, Yasunobu: *See*—
Yamamoto, Masanari; Ito, Yasunobu; and Suzuki, Kenji, 4,899,278, Cl. 364-424.100.

Itoh, Hirosumi: *See*—
Nomura, Etsuzo; Takeuchi, Hirokazu; Suzuki, Shigeru; Irie, Kazunori; and Itoh, Hirosumi, 4,898,110, Cl. 112-314.000.

Itoh, Isao: *See*—
Yamamoto, Takehiko; Kubota, Terumasa; Itoh, Isao; Kato, Hiroyuki; Kikuchi, Terumi; Kawasaki, Hiroko; Mashimoto, Misako; and Oki, Yuji, 4,898,738, Cl. 426-17.000.

Itoh, Mituru. Door apparatus. 4,897,962, Cl. 49-208.000.

Itoh, Nobuo: *See*—
Takeda, Kazuo; Sekikawa, Nobuyuki; Hayasaka, Katsuhiro; Fujunuma, Chikao; Itoh, Nobuo; and Kubota, Tetsuya, 4,898,837, Cl. 437-31.000.

Itoh, Seiga; Takeichi, Yasutoshi; and Sato, Moriyuki, to Kyowa Hakko Kogyo Co., Ltd. Novel human interferon-γ polypeptide derivative. 4,898,931, Cl. 530-351.000.

Itoh, Toshiyuki: *See*—
Nakayama, Okihiko; Itoh, Toshiyuki; and Mizushima, Katsuhiko, 4,899,285, Cl. 364-453.000.

Itoh, Tsutomu: *See*—
Kozoe, Katsutoshi; Furuya, Nobuo; Kimura, Shinichi; Okamoto, Yasunari; Kumada, Mitsuyoshi; Sugimoto, Tatsuo; Ueno, Takehiko; Shimizu, Kenjiro; and Itoh, Tsutomu, 4,898,116, Cl. 118-621.000.

Itsuki, Fumiaki: *See*—
Nakama, Katsuhiko; Ninomiya, Hiroshi; Michishige, Toru; and Itsuki, Fumiaki, 4,898,549, Cl. 439-701.000.

Iwamatsu, Masayuki, to Yamaha Corporation. Digital signal processing circuit. 4,899,150, Cl. 341-118.000.

Iwamoto, Yoshinao: *See*—
Mochizuki, Kiyofumi; Edagawa, Noboru; and Iwamoto, Yoshinao, 4,899,043, Cl. 250-227.000.

Iwasa, Hiroki; Watanabe, Toyofumi; and Furuya, Hirohide, to NKK Corporation. Method for manufacturing electrolytically chromated steel sheet. 4,898,649, Cl. 204-28.000.

Iwasawa, Naozumi: *See*—
Hoshino, Masahiro; Kobayashi, Isao; Seko, Kenji; Iwasawa, Naozumi; Akaki, Yuu; and Kondo, Toshio, 4,898,656, Cl. 204-181.100.

Iwatschenko, Peter, to Pfrimmer-Viggo GmbH & Co. KG. Device for administering liquid. 4,898,581, Cl. 604-122.000.

Izawa, Shinichiro: *See*—
Sanada, Makoto; Yamashita, Hiroshi; Izawa, Shinichiro; and Hamamoto, Toshikazu, 4,898,131, Cl. 123-90.440.

Izumi, Masaki, to Eastman Kodak Company. Selective energization of thermal printers. 4,899,170, Cl. 346-76.0PH.

Izumo, Takeshi: *See*—
Takeya, Noriyoshi; Ishii, Hidehiro; Watanabe, Osamu; Yoshio, Junichi; Katakami, Kazuhiko; and Izumo, Takeshi, 4,899,326, Cl. 369-36.000.

J. I. Case Company: *See*—
Horsch, Joachim, 4,898,075, Cl. 91-477.000.

J. L. Clark, Inc.: *See*—
VerWeyst, Gordon E.; Burk, Charles E.; and Pherigo, Douglas E., 4,898,292, Cl. 215-237.000.

Jackson, Andrew M.: *See*—
McCrindle, John A.; Steiner, Antony F.; and Jackson, Andrew M., 4,899,036, Cl. 235-380.000.

Jackson, Thomas, to Plessey Overseas Limited. Apparatus and method for analogue to digital conversion. 4,899,155, Cl. 341-200.000.

Jacob, Adir. Process and apparatus for dry sterilization of medical devices and materials. 4,898,715, Cl. 422-186.290.

Jacobs, Joseph M.: *See*—
Hubbard, Robert F.; and Jacobs, Joseph M., 4,898,416, Cl. 294-119.100.

Jacobs Manufacturing Company, The: *See*—
Meistrick, Zdenek S.; and Quenneville, Raymond N., 4,898,206, Cl. 137-512.300.

Jagers, Erhard: *See*—
Erpenbach, Heinz; Gehrmann, Klaus; Horstermann, Peter; Jagers, Erhard; and Kohl, Georg, 4,898,966, Cl. 560-38.000.

Jaguar Cars Limited: *See*—
Parsons, Bryan N. V., 4,898,042, Cl. 74-68.000.
Parsons, Bryan N. V., 4,898,130, Cl. 123-90.160.

Jahn, Dieter: *See*—
Keil, Michael; Jahn, Dieter; Becker, Rainer; Rohr, Wolfgang; and Wuerzer, Bruno, 4,898,610, Cl. 71-121.000.

Jakatdar, Priya: *See*—
Wahi, Ashok L.; and Jakatdar, Priya, 4,899,372, Cl. 379-184.000.

Jakobi, Ralf: *See*—
Seip, Hermann; Wagner, Wilfried; and Jakobi, Ralf, 4,898,073, Cl. 91-369.200.

James River Corporation: *See*—
Geyser, Joseph E.; and Kozbur, Nestor, 4,897,980, Cl. 53-128.000.

James, Robert B., Jr.: *See*—
Kalnes, Tom N.; and James, Robert B., Jr., 4,899,001, Cl. 585-310.000.

Janda, Frantisek: *See*—
Fencl, Zdenek; Janda, Frantisek; Kovarik, Karel; Sara, Jiri ; and Tatoun, Antonin, 4,898,006, Cl. 62-48.200.

Jang, Yue-Teh; Liebmann, Vern L.; Villman, Glenda S.; and Amin, Surendra A., to Mallinckrodt, Inc. Nylon-PEBA copolymer catheter. 4,898,591, Cl. 604-282.000.

Jannson, Joanna: *See*—
Jannson, Tommasz; Jannson, Joanna; and Yeung, Peter, 4,898,450, Cl. 350-96.210.

Jannson, Tommasz; Jannson, Joanna; and Yeung, Peter, to Physical Optics Corporation. Expanded beam non-imaging fiber optic connector. 4,898,450, Cl. 350-96.210.

Janowski, Valery, to Gefrem. Pressure closing device for joining the edges of plastic sheets. 4,898,492, Cl. 403-340.000.

Jansa, Ladislav: *See*—
Salajka, Zdenek; Hamrik, Odlrich; Kratochvila, Jan; Gheorghiu, Mihnea; Krivanek, Josef; Sindelar, Pavel; Zaloudik, Petr; Legeza, Vasil; and Jansa, Ladislav, 4,898,847, Cl. 522-110.000.

Janson, David A.: *See*—
Garrett, Wayne H.; and Janson, David A., 4,898,266, Cl. 192-21.500.
Garrett, Wayne H.; and Janson, David A., 4,898,267, Cl. 192-21.500.

Janssen, Peter J. M.: *See*—
Sleegers, Franciscus T.; Schuitmaker, Pieter D.; and Janssen, Peter J. M., 4,899,329, Cl. 369-275.000.

Janssen Pharmaceutica N.V.: *See*—
Wals, Lourens; and Cooymans, Ludwig P., 4,898,873, Cl. 514-327.000.

Janssen, Sylvain: *See*—
Wright, Oliver; and Janssen, Sylvain, 4,899,046, Cl. 250-227.000.

Janusz, John M.; Loomans, Maurice E.; LaHann, Thomas R.; and Kasting, Gerald B., to Procter & Gamble Company, The. Compounds and compositions having anti-inflammatory and analgesic activity. 4,898,887, Cl. 514-617.000.

Japan Aviation Electronics Industry, Limited: *See*—
Endo, Hiroshi; Suzuki, Takao; Komoto, Mitsuo; Uekido, Kouzou; and Tokaichi, Tetsuro, 4,898,545, Cl. 439-578.000.

Japan Silicon Co., Ltd.: *See*—
Takahashi, Yutaka, 4,897,966, Cl. 51-131.300.

Jarnot, Frank R., to Airlette Manufacturing Corporation. Push-in flexible cover vent. 4,898,085, Cl. 98-1.000.

Jastrzebski, Johann T. B. H.: *See*—
Van Koten, Gerard; Van Der Steen, Frederick H.; and Jastrzebski, Johann T. B. H., 4,898,955, Cl. 556-12.000.

Jeffress, Robert D.: *See*—
Dosaj, Vishu D.; May, James B.; and Jeffress, Robert D., 4,898,712, Cl. 420-578.000.

Jennings, Alfred R., Jr.; and Shu, Paul, to Mobil Oil Corporation. Method for suspending wells. 4,898,242, Cl. 166-285.000.

Jennings, Gary K. Frozen food container for aircraft usage. 4,898,294, Cl. 220-3.100.

Jensen, James W.: *See*—
Barvinek, Todd A.; and Jensen, James W., 4,897,960, Cl. 49-49.000.

Jeumont Schneider Corporation: *See*—
Dumoulin, Jean-Loup, 4,899,211, Cl. 357-82.000.

Jidosha Kiki Co., Ltd.: *See*—
Ohe, Takeshi; Taniguchi, Yoshiaki; and Nishikiori, Hiroshi, 4,898,258, Cl. 180-79.100.

Jih, Ronald R. H.; and Chi, Jir.g-Shuen. Built-up stand. 4,898,353, Cl. 24.8-188.700.

Jim Walter Reasearch Corp.: *See*—
Israel, Michael G.; Grozdits, George A.; and Trout, Kenneth G., 4,898,776, Cl. 428-336.000.

Jinnouchi, Takeshi: *See*—
Sakamaki, Hiroshi; Horikoshi, Yukio; and Jinnouchi, Takeshi, 4,898,526, Cl. 418-257.000.

Jitsukawa, Koichiro: *See*—
Fujii, Setsuro; Ishikawa, Hiroshi; Yasumura, Koichi; Jitsukawa, Koichiro; Toyama, Sachio; Tsubouchi, Hidetsugu; Sudo, Kimio; and Tsuji, Kouichi, 4,898,859, Cl. 514-210.000.

Johannes Heidenhain GmbH: *See*—
Ernst, Alfons; and Spark, Dieter, 4,897,929, Cl. 33-559.000.

Johannsen, Fred, to Olympia Aktiengesellschaft. Method of providing an ink jet printing head with piezo-crystals. 4,897,903, Cl. 29-25.350.

Johansson, Sven-Erik V.: *See*—
Bystrom, Olof L.; and Johansson, Sven-Erik V., 4,898,054, Cl. 82-160.000.

John D. Brush & Co., Inc.: *See*—
Arp, George F., 4,898,707, Cl. 264-515.000.

Johns, Gary: *See*—
Wills, Brian; and Johns, Gary, 4,898,530, Cl. 431-11.000.

Johns, Robert H., to Allegheny Ludlum Corporation. Apparatus for determining surface profiles of metallic workpieces. 4,897,925, Cl. 33-22.000.

Johnson, Charles G.; and Sanchez, Candido O. Heavy-metal separator for drinking water. 4,898,678, Cl. 210-741.000.

Johnson, David L.: *See*—
Avidan, Amos A.; Johnson, David L.; and Soto, Jorge L., 4,899,014, Cl. 585-533.000.

Johnson, Donald A.; Hoots, John E.; Fong, Dodd W.; and Crucil, Guy A., to Nalco Chemical Company. Zinc stabilization with modified acrylamide based polymers and corrosion inhibition derived therefrom. 4,898,686, Cl. 252-389.200.

Johnson, James M., Jr.; and Spanke, Ronald A., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Self routing packet switching network architecture. 4,899,335, Cl. 370-60.000.

Johnson & Johnson Orthopaedics, Inc.: *See*—
Buese, George J.; and Yoon, Hee K., 4,898,159, Cl. 128-90.000.

Johnson, Lennart B. Roller ski. 4,898,403, Cl. 280-842.000.

Johnson Products Co., Inc.: *See*—
Beste, Marion D., 4,898,726, Cl. 424-72.000.

Johnson, Robert R.; and Riehl, Tilford F., to Brown & Williamson Tobacco Corporation. Smoking device. 4,898,191, Cl. 131-359.000.

Johnson, Walter A.: *See*—
Ritsko, Joseph E.; Johnson, Walter A.; and Kopatz, Nelson E., 4,898,749, Cl. 427-216.000.

Jones, Frank A., Jr., to Norris, Jerome J. Anti-separation coaxial connector tie-straps. 4,898,542, Cl. 439-371.000.

Jones, George B.; and Mills, Edward A., to United Engineering, Inc. Roll bite gauge and profile measurement system for rolling mills. 4,898,012, Cl. 72-11.000.

Jones, Gerald M., to GTE Products Corporation. Electrical contact bender. 4,898,215, Cl. 140-105.000.

Jones, Glenn C.; and Nottingham, William D., to Eastman Kodak Company. Transesterification of alkoxyesters. 4,898,969, Cl. 560-187.000.

Jones, Michael L.: *See*—
Borsanyi, Alexander S.; and Jones, Michael L., 4,898,585, Cl. 604-153.000.

Jones, Raymond V. H.; and Fleming, Ian G. C., to Imperial Chemical Industries PLC. Halophenylethylenes. 4,898,997, Cl. 570-128.000.

Jones, Ronald L., to Dana Corporation. Piston head and rod assembly for a gear pump dry valve. 4,898,083, Cl. 92-255.000.

Jordan, Norman M.; and McLaughlin, Donald, to Honeywell Inc. Modified propellant increments for short range training round propulsion system. 4,898,097, Cl. 102-283.000.

Jorgensen, Robert W.; and Schnell, Kenneth R., to Hubbell Incorporated. Electrical box support. 4,898,357, Cl. 248-906.000.

Joshi, Sushama: *See*—
Yamazaki, Hiroshi; and Joshi, Sushama, 4,898,817, Cl. 435-49.000.

Joy, Robert D.: *See*—
Thorne, Glenn A.; Joy, Robert D.; and Simpson, Jeff A., 4,898,464, Cl. 356-152.000.

Joy Technologies, Inc.: *See*—
Cowles, Dennis, 4,897,904, Cl. 29-33.00K.

Jufuku, Yasunobu: *See*—
Tatara, Yudai; Sato, Kiyoomi; Okawa, Susumu; and Jufuku, Yasunobu, 4,898,567, Cl. 474-174.000.

Juki Corporation: *See*—
Suzuki, Norio, 4,898,351, Cl. 248-51.000.

Jundt, Jacques: *See*—
Clark, Brian; Jundt, Jacques; Luling, Martin; and Ross, Michael O., 4,899,112, Cl. 324-338.000.

Junghans, Ewald; and Tittizer, Gabriel, to Interatom GmbH. Valve control of internal combustion engines by means of a cam-driven rotary piston pump. 4,898,129, Cl. 123-90.130.

Jungkman, David L.; Comey, David M.; Stern, Ronald D.; and Musicant, Bruce L., to Honeywell Inc. Dark mirror coated prism. 4,898,435, Cl. 350-1.100.

Juntunen, Timothy J.: *See*—
Skrtic, Tom; and Juntunen, Timothy J., 4,898,275, Cl. 206-330.000.

Jutand, Francis; Demassieux, Nicolas; and Dana, Michel. Circuit to perform a linear transformation on a digital signal. 4,899,300, Cl. 364-725.000.

Kabushiki Kaisha Iseki Kaihatsu Koki: *See*—
Akesaka, Toshio, 4,898,498, Cl. 405-184.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Urata, Chieo, 4,898,225, Cl. 164-158.000.

Kabushiki Kaisha Neriki: *See*—
Nitta, Jiro, 4,898,210, Cl. 137-614.190.

Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho: *See*—
Yamamoto, Toshimasa, 4,898,033, Cl. 73-514.000.

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Furukawa, Hiroshi, 4,899,110, Cl. 324-320.000.
Ishii, Masaru; and Odawara, Kazuharu, 4,899,328, Cl. 369-77.200.
Kimura, Mitsutoshi; and Nieda, Yasuhiro, 4,899,085, Cl. 315-116.000.
Miyazaki, Yoshiro, 4,898,231, Cl. 165-13.000.
Shibagaki, Taro; Atsumi, Takehiko; Ibe, Hiroyuki; and Tanikoshi, Sadao, 4,899,339, Cl. 370-102.000.
Takano, Masayuki; Hiki, Susumu; and Kikuti, Yuusiti, 4,898,177, Cl. 128-662.030.
Tanimoto, Koji; Miura, Kunihiko; and Koseki, Junichi, 4,899,226, Cl. 358-451.000.
Yoshiike, Yoshiji; and Satou, Yoshinori, 4,899,090, Cl. 315-335.000.

Kadee Metal Products Co.: *See*—
Edwards, Clarence K.; and Edwards, Lawrence D., 4,898,326, Cl. 238-10.00E.

Kadwell, Brian J.; Fowler, Daniel L.; and Gawron, Gregory F., to Robertshaw Controls Company. Method of operating a control unit. 4,899,034, Cl. 219-494.000.

Kaepa, Inc.: *See*—
Fuerst, Rory W., 4,897,936, Cl. 36-30.00A.

Kafchinski, Edward R.: *See*—
Chenevey, Edward C.; and Kafchinski, Edward R., 4,898,924, Cl. 528-183.000.

Kagawa, Nobuaki: *See*—
Tachibana, Noriki; Nishizeki, Masato; and Kagawa, Nobuaki, 4,898,808, Cl. 430-510.000.

Kage, Kouzou, to NEC Corporation. Signal communication capable of avoiding an audible reproduction of a sequence of information signals. 4,899,350, Cl. 375-52.000.

Kago, Yoshiyuki: *See*—
Numata, Koji; Asakura, Fumio; Kago, Yoshiyuki; Nozawa, Masaei; Shibakawa, Takahiro; Akado, Hajime; and Kato, Hideharu, 4,898,462, Cl. 356-70.000.

Kagoroku, Nobuo: *See*—
Ichikawa, Toru; Kodama, Shuichi; Kagoroku, Nobuo; Ito, Shotaro; and Honda, Shuichi, 4,898,003, Cl. 62-244.000.

Kahan, Gary. Method of and apparatus for decoding Huffman or variable-length coees. 4,899,149, Cl. 341-67.000.

Kahl, Karl H. Dual sequence solar water heater. 4,898,152, Cl. 126-422.000.

Kahle, Werner: *See*—
Havenstein, Alfred G.; Kahle, Werner; and Schnell, Dagmar, 4,898,740, Cl. 426-106.000.

Kahn, Jon B., to United States of America, National Aeronautics and Space Administration. Docking system for spacecraft. 4,898,348, Cl. 244-161.000.

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Uemura, Toshinobu; Kai, Keiji; Kodani, Masateru; Yoshida, Fumiyo; and Aratani, Matsuhiko, 4,898,937, Cl. 540-227.000.

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Tasaki, Yoji; Kurokawa, Koichi; Hattori, Katsuhide; Takano, Mikio; Miyajima, Toshikazu; Sato, Toshifumi; and Ogasawara, Katsura, 4,898,095, Cl. 102-201.000.

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Sato, Toshio; Matsumoto, Hitoshi; and Kakegawa, Hisao, 4,898,890, Cl. 514-685.000.

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Nagahama, Fumio; Kakimoto, Norihiro; and Miyao, Kohei, 4,898,882, Cl. 514-492.000.

Kaku, Nobuyuki: *See*—
Kano, Kiyoshi; Kaku, Nobuyuki; Osawa, Atsuo; Fujimori, Shinya; and Fukagawa, Yoshihiro, 4,899,235, Cl. 360-85.000.

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Miyakawa, Hideaki; and Kameyama, Makoto, 4,899,241, Cl. 360-125.000.

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Miyashita, Shunitsu; and Mogami, Kenji, 4,898,911, Cl. 525-74.000.

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Asada, Masanori; Hamaguchi, Shigeki; Katsuki, Hidetoshi; Nakamura, Yoshio; Takahashi, Hideyuki; Takahara, Kenji; Shimada, Yoshio; Ohashi, Takehisa; and Watanabe, Kiyoshi, 4,898,822, Cl. 435-121.000.

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Tamada, Hitoshi; Kaneko, Masahiko; and Okamoto, Tsutomu, 4,898,440, Cl. 350-96.130.

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Araki, Morio; Mori, Shigeto; Kaneko, Michihiro; and Go, Yasunao, 4,899,138, Cl. 340-712.000.

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Hoshino, Masahiro; Kobayashi, Isao; Seko, Kenji; Iwasawa, Naozumi; Akaki, Yuu; and Kondo, Toshio, 4,898,656, Cl. 204-181.100.

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Kanda, Nobuo; Omura, Haruo; Abe, Yukihiro; and Kondo, Mitsuru, 4,898,941, Cl. 540-596.000.

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Chen, Tien-Tsung; Wegdell, C. Stefan; Rutkowski, Wayne L.; and Kao, Kim Y., 4,898,323, Cl. 229-92.300.

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Gopon, Gunter, 4,898,359, Cl. 249-54.000.

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Falk, Robert A.; Clark, Kirtland P.; and Karydas, Athanasios, 4,898,981, Cl. 568-28.000.

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Humphrey, Brian D.; Kasner, Marc L.; and Isidor, John L., 4,898,921, Cl. 527-300.000.

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Halloran, Daniel J.; Kasprzak, Kenneth A.; Savastano, Stefano G.; and Swihart, Terence J., 4,898,614, Cl. 106-3.000.

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Janusz, John M.; Loomans, Maurice E.; LaHann, Thomas R.; and Kasting, Gerald B., 4,898,887, Cl. 514-617.000.

Katakami, Kazuhiko: *See*—
Takeya, Noriyoshi; Ishii, Hidehiro; Watanabe, Osamu; Yoshio, Junichi; Katakami, Kazuhiko; and Izumo, Takeshi, 4,899,326, Cl. 369-36.000.

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Morisawa, Yasuhiro; Kataoka, Mitsuru; Sugiyama, Mitsuo; Saito, Fujio; Koike, Hiroyuki; Oshima, Takeshi; Simoji, Yasuo; and Nagahori, Hitoshi, 4,898,862, Cl. 514-236.200.

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Kishino, Takao; Katayama, Minoru; Yano, Kazuyuki; and Ohtsuka, Isao, 4,899,081, Cl. 313-496.000.

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Numata, Koji; Asakura, Fumio; Kago, Yoshiyuki; Nozawa, Masaei; Shibakawa, Takahiro; Akado, Hajime; and Kato, Hideharu, 4,898,462, Cl. 356-70.000.

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Shibata, Hiroshi; Maehara, Fuyuki; Shintai, Akira; and Kato, Hidetoshi, 4,899,209, Cl. 357-74.000.

Kato, Hiroyuki: *See*—
Yamamoto, Takehiko; Kubota, Terumasa; Itoh, Isao; Kato, Hiroyuki; Kikuchi, Terumi; Kawasaki, Hiroko; Mashimoto, Misako; and Oki, Yuji, 4,898,738, Cl. 426-17.000.

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Konishi, Masahiro; Inuiya, Masafumi; Muramatsu, Akira; and Kato, Masahiro, 4,899,213, Cl. 358-44.000.

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Narutomi, Yuji; Katsumata, Manabu; Osawa, Yasuko; and Uchikuga, Saburo, 4,898,870, Cl. 514-292.000.

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Tamamura, Toshiaki; Katsuta; Niwa, Osamu; Hikita, Makoto; and Sugita, Akio, 4,898,766, Cl. 428-195.000.

Katsuta, Tsuyoshi: *See*—
Morita, Hideki; Sugawara, Kazuhiro; Hung, Pe-Chieh; Hara, Hirotaka; Nakamura, Tadashi; Kobayashi, Kazuyuki; Azuma, Masashi; and Katsuta, Tsuyoshi, 4,899,215, Cl. 358-78.000.

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Sato, Takuro; Shimazaki, Yoshihito; and Kawabe, Manabu, 4,899,148, Cl. 341-65.000.

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Fujitani, Yuuki; and Kawakami, Kouji, 4,898,259, Cl. 180-250.000.

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Nishitani, Takao; Kawakami, Yuichi; Tanaka, Hideo; and Kuroda, Ichiro, 4,899,301, Cl. 364-726.000.

Kawakatsu, Yoshifumi: *See*—
Yoshinari, Osamu; Kawakatsu, Yoshifumi; Takahashi, Hayashi; and Fukuizumi, Hideaki, 4,898,700, Cl. 264-83.000.

Kawakita, Kenzo: *See*—
Furukawa, Hiroshi; Uemichi, Sachio; Isoi, Toshihiro; and Kawakita, Kenzo, 4,898,796, Cl. 429-178.000.

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Yamamoto, Takehiko; Kubota, Terumasa; Itoh, Isao; Kato, Hiroyuki; Kikuchi, Terumi; Kawasaki, Hiroko; Mashimoto, Misako; and Oki, Yuji, 4,898,738, Cl. 426-17.000.

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Asakura, Yukio, 4,898,114, Cl. 114-343.000.
Tamba, Shinichi; Miyazaki, Takeshi; and Miguchi, Akio, 4,898,040, Cl. 74-15.630.
Ueki, Noriyuki; and Nishimura, Shigeru, 4,898,207, Cl. 137-539.000.

Kawasaki Steel Corp.: *See*—
Ishibashi, Genichi; Kamano, Hideyuki; and Seki, Masahiko, 4,898,600, Cl. 55-222.000.

Kawase, Ritsuo, to NOK Corporation. Device for sealing refueling opening. 4,898,395, Cl. 277-207.00A.

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Morii, Mitsuyoshi; Oboka, Masaharu; Suzuki, Toshihiko; Suzuki, Katsuyuki; Kawashima, Nobuhiro; Morii, Noriko; and Mori, Kunizo, 4,898,825, Cl. 435-212.000.

Kayser, Michael: *See*—
Franckowiak, Gerhard; Bechem, Martin; Kayser, Michael; Gross, Rainer; Schramm, Matthias; Seuter, Friedel; Perzborn, Elisabeth; and Thomas, Gunther, 4,898,865, Cl. 514-252.000.
Meyer, Horst; Schwesner, Eckhard; Bechem, Martin; Gross, Rainer; Schramm, Matthias; Kayser, Michael; and Hebisch, Siegbert, 4,898,877, Cl. 514-521.000.

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Saito, Masayuki; and Kazama, Yasuo, 4,898,370, Cl. 269-91.000.

Kazama, Yoshiharu: *See*—
Omoda, Koichiro; Miyamoto, Shunsuke; Nakagawa, Takayuki; Takamine, Yoshio; Nagashima, Shigeo; Miyoshi, Masayuki; Kazama, Yoshiharu; and Kinoshita, Yoshiaki, 4,899,273, Cl. 364-200.000.

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Searfoss, Jerry R.; and Keister, Bernard, 4,898,212, Cl. 138-130.000.

Keldany, Rachid; and Shaw, Keith J. Method of placing plastic tubes into existing openings. 4,897,911, Cl. 29-429.000.

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Vaught, John L.; Neukermans, Armand P.; Keldermann, Herman F.; and Koenig, Franklin R., 4,898,471, Cl. 356-394.000.

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Kelly, Mark R.: *See*—
Kelly, Bryan M.; Fernandes, Jorge M.; Kelly, Matthew F.; and Kelly, Mark R., 4,898,391, Cl. 273-310.000.

Kelly, Matthew F.: *See*—
Kelly, Bryan M.; Fernandes, Jorge M.; Kelly, Matthew F.; and Kelly, Mark R., 4,898,391, Cl. 273-310.000.

Kelly, Stephen: *See*—
Buchecker, Richard; Germann, Alfred; Kelly, Stephen; and Schadt, Martin, 4,898,455, Cl. 350-350.00R.

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Robertson, Kenneth L., 4,898,747, Cl. 427-31.000.

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Diman, Charles; Marcus, David; Mitchell, Philip; and Sachs, Samuel B., 4,898,667, Cl. 210-138.000.

Kendall, John E.: *See*—
Manyik, Robert M.; Brockwell, Jonathan L.; and Kendall, John E., 4,899,003, Cl. 585-313.000.

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Hempel, Gerhard; Kennecke, Mario; Krieger, Bernhard; Phillippson, Rainer; Triem, Hermann; and Weber, Alfred, 4,898,693, Cl. 260-397.400.

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Conley, Jeff A.; and Lynch, Jeffrey T., 4,898,201, Cl. 137-245.500.

Khan, Emdadur R., to Fairchild Semiconductor Corporation. High density ROM in a CMOS gate array. 4,899,308, Cl. 365-104.000.

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Vroomen, Laurentius C. J.; Van Eadonk, Johannes; Khoe, Giok D.; and Swemmers, Antonius H. M., 4,898,449, Cl. 350-96.210.

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Kawakami, Shinya; and Kikuchi, Masahara, 4,898,905, Cl. 524-404.000.

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Yamamoto, Takehiko; Kubota, Terumasa; Itoh, Isao; Kato, Hiroyuki; Kikuchi, Terumi; Kawasaki, Hiroko; Mashimoto, Misako; and Oki, Yuji, 4,898,738, Cl. 426-17.000.

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Nakai, Satoru; Kaneta, Mayumi; Kikumoto, Yoshikazu; Hong, Yeong-Man; Kawai, Kazuyoshi; Takegata, Setsuko; Ishii, Kiyoshi; Yanagihara, Yasuo; and Hirai, Yoshikatsu, 4,898,818, Cl. 435-69.100.

Kikuti, Yuusiti: *See*—
Takano, Masayuki; Hiki, Susumu; and Kikuti, Yuusiti, 4,898,177, Cl. 128-662.030.

Kim, Dae Sik. Spin welded, tamper-proof, resealable thermoplastic container. 4,898,295, Cl. 220-66.000.
Kim, Hongkyu: *See*—
Collins, George L.; Wissbrun, Kurt F.; and Kim, Hongkyu, 4,898,925, Cl. 528-230.000.
Kime, James A.; and McMenamin, Gregory R., to H.Y.O., Inc. Hydraulic system for use with snow-ice removal vehicles. 4,898,333, Cl. 239-657.000.
Kimura, Masayuki, to NEC Corporation. Fault detection system for an arithmetic unit. 4,899,303, Cl. 364-739.000.
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Kozoe, Katsutoshi; Furuya, Nobuo; Kimura, Shinichi; Okamoto, Yasunari; Kumada, Mitsuyoshi; Sugimoto, Tatsuo; Ueno, Takehiko; Shimizu, Kenjiro; and Itoh, Tsutomu, 4,898,116, Cl. 118-621.000.
Kimura, Takashi: *See*—
Doumoto, Hideki; and Kimura, Takashi, 4,898,094, Cl. 101-485.000.
Kimura, Yoichi: *See*—
Takewa, Hiroyuki; Serikawa, Mitsuhiko; Ishikawa, Seiichi; Usuki, Sawako; Kimura, Yoichi; and Obata, Shuichi, 4,899,390, Cl. 381-154.000.
Kimura, Yoshihiko: *See*—
Yamada, Morio; and Kimura, Yoshihiko, 4,898,023, Cl. 73-52.000.
Kinal, Mary: *See*—
Bauer, Eric J.; Davenport, Esther L.; Kinal, Mary; and King, Michael C., 4,899,377, Cl. 379-354.000.
Kinbara, Hiroji: *See*—
Takeuchi, Muneo; Kinbara, Hiroji; and Tsuruta, Masafumi, 4,899,073, Cl. 310-116.000.
Kindler, Edwin A.; and Tran, Danh C., to Infrared Fiber Systems. High-strength fluoride glass fibers and process of making. 4,898,777, Cl. 428-364.000.
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Bauer, Eric J.; Davenport, Esther L.; Kinal, Mary; and King, Michael C., 4,899,377, Cl. 379-354.000.
Kingsford, Ted, to Plough, Inc. Moveable display rack assembly. 4,898,283, Cl. 211-57.100.
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Kingsman, Susan M.: *See*—
Kingsman, Alan J.; and Kingsman, Susan M., 4,898,823, Cl. 435-172.300.
Kinoshita, Kimio: *See*—
Ito, Nobuhiko; Kinoshita, Kimio; Suzuki, Kiyonori; and Eto, Takeaki, 4,898,985, Cl. 568-344.000.
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Omoda, Koichiro; Miyamoto, Shunsuke; Nakagawa, Takayuki; Takamine, Yoshio; Nagashima, Shigeo; Miyoshi, Masayuki; Kazama, Yoshiharu; and Kinoshita, Yoshiaki, 4,899,273, Cl. 364-200.000.
Kioritz Corporation: *See*—
Aiyama, Fumihiko; and Hirayama, Koji, 4,898,039, Cl. 74-6.000.
Kirkham, Randy R.: *See*—
Cry, John W.; Kirkham, Randy R.; McBride, John F.; Simmons, Carver S.; and Gee, Glendon W., 4,899,047, Cl. 250-227.000.
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Sakamoto, Takashi; and Kitagawa, Kazumaro, 4,898,463, Cl. 356-73.100.
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Kitamura, Yutaka, to Mitsubishi Denki Kabushiki Kaisha. Engine starting and charging device. 4,898,038, Cl. 74-6.000.
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Kitayama, Tooru; and Ohtani, Toshiya, to Nissan Motor Company, Limited. Engine control apparatus. 4,898,139, Cl. 123-425.000.
Kitayama, Yukio, deceased: *See*—
Ochiai, Izumi; Miyagi, Masahiro; Nozawa, Yoshio; and Kitayama, Yukio, deceased, 4,898,232, Cl. 165-151.000.
Kitayama, Yuko, Midori Kitayama, Takahisha Kitayama, successors: *See*—
Ochiai, Izumi; Miyagi, Masahiro; Nozawa, Yoshio; and Kitayama, Yukio, deceased, 4,898,232, Cl. 165-151.000.
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Klapheke, Chris G.: *See*—
Block, Wayne F.; Wright, Wade S.; and Klapheke, Chris G., 4,898,628, Cl. 148-111.000.
Klas, Kenneth H.; and Brown, Richard R., to Simplicity Manufacturing, Inc. High efficiency snowthrower. 4,897,942, Cl. 37-244.000.
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Ketchum, Richard H.; Kleijn, Willem B.; and Krasinski, Daniel J., 4,899,385, Cl. 381-36.000.
Klein, Hans-Christof, to Alfred Teves GmbH. Brake pressure modulator for a brake skid-controlled brake system for automotive vehicles. 4,898,433, Cl. 303-115.000.
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Shapiro, Bennett M.; Turner, Eric E.; Hopkins, Paul B.; Klevit, Rachel E.; Holler, Tod P.; and Spaltenstein, Andreas, 4,898,878, Cl. 514-386.000.
Kliger, Isaac E.; and Beckerleg, Richard A., to Raytheon Company. Apparatus and method for controlling a cannon-launched projectile. 4,898,340, Cl. 244-3.110.
Klink, Josef: *See*—
Kolle, Erwin; and Klink, Josef, 4,898,423, Cl. 297-362.000.
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Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Epper, Wolfgang; and Gildemeister, Hans-H., 4,898,571, Cl. 494-26.000.
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Lin, You-Jyh; and Kloczewski, Harold, 4,898,988, Cl. 568-386.000.
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Kamis, Russell P.; Klosowski, Jerome M.; and Lower, Loren D., 4,898,910, Cl. 524-860.000.
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Knifton, John F., to Texaco Chemical Company. Method for production of phenol/acetone from cumene hydroperoxide. 4,898,987, Cl. 568-385.000.
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Baba, Fumio; Kobayashi, Kazuya; Enomoto, Seiji; and Ogawa, Hiroaki, 4,899,310, Cl. 365-189.050.
Kobayashi, Kazuyuki: *See*—
Morita, Hideki; Sugawara, Kazuhiro; Hung, Pc-Chieh; Hara, Hirotaka; Nakamura, Tadashi; Kobayashi, Kazuyuki; Azuma, Masashi; and Katsuta, Tsuyoshi, 4,899,215, Cl. 358-78.000.
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Kobayashi, Susumu: *See*—
Sano, Yoshikazu; Kobayashi, Susumu; and Endo, Kiyoshi, 4,899,297, Cl. 364-557.000.
Kobelt, Jacob. Valve apparatus. 4,898,203, Cl. 137-269.000.
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Kobayashi, Kazuhiro; Koboshi, Shigeharu; and Miyaoka, Kazuyoshi, 4,898,807, Cl. 430-378.000.
Kobrin, Hy Herman. Exercising device. 4,898,380, Cl. 272-117.000.
Koch, Karl C.: *See*—
Einolf, Charles W., Jr.; Shutterly, Harold B.; Sun, Shan C.; Gonnam, Russel W.; Ray, Roger E.; Koch, Karl C.; and Maynard-Nenno, Pamela M., 4,899,383, Cl. 380-48.000.
Kochs Adler Aktiengesellschaft: *See*—
Scholl, Hans, 4,898,109, Cl. 112-121.140.

Kodama, Shuichi: *See*—
Ichikawa, Toru; Kodama, Shuichi; Kagoroku, Nobuo; Ito, Shotaro; and Honda, Shuichi, 4,898,003, Cl. 62-244.000.
Kodani, Masateru: *See*—
Uemura, Toshinobu; Kai, Keiji; Kodani, Masateru; Yoshida, Fumiyo; and Aratani, Matsuhiko, 4,898,937, Cl. 540-227.000.
Koenig, Franklin R.: *See*—
Vaught, John L.; Neukermans, Armand P.; Keidermann, Herman F.; and Koenig, Franklin R., 4,898,471, Cl. 356-394.000.
Koerner, Michael S.: *See*—
Weigand, Francis K.; Ness, Ronald J.; and Koerner, Michael S., 4,898,000, Cl. 60-740.000.
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Otake, Katsumi; Sakamoto, Kiichiro; and Kogane, Mikio, 4,897,944, Cl. 40-159.000.
Kogawa, Kuniyuki: *See*—
Ohtake, Shigeaki; Kogawa, Kuniyuki; and Hirota, Takato, 4,899,120, Cl. 335-132.000.
Kogiso, Takashi; and Kurachi, Yoshio, to Howa Machinery, Ltd. Method and apparatus for transporting roving bobbins in a spinning factory. 4,897,992, Cl. 57-281.000.
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Nomura, Etsuzo; Takeuchi, Hirokazu; Suzuki, Shigeru; Irie, Kazunori; and Itoh, Hirosumi, 4,898,110, Cl. 112-314.000.
Kohl, Georg: *See*—
Erpenbach, Heinz; Gehrmann, Klaus; Horstermann, Peter; Jagers, Erhard; and Kohl, Georg, 4,898,966, Cl. 560-38.000.
Kohler Co.: *See*—
Bader, Mark S., 4,898,133, Cl. 123-182.000.
Kohno, Teruhisa; Hashida, Koichi; and Takata, Koji, to Sumitomo Electric Industries, Ltd. Brake pressure control device for vehicles. 4,898,434, Cl. 303-119.000.
Koike, Hiroyuki: *See*—
Morisawa, Yasuhiro; Kataoka, Mitsuru; Sugiyama, Mitsuo; Saito, Fujio; Koike, Hiroyuki; Oshima, Takeshi; Simoji, Yasuo; and Nagahori, Hitoshi, 4,898,862, Cl. 514-236.200.
Koike, Shiro: *See*—
Osada, Koji; Date, Haruyuki; Saihara, Yasuhiro; Yamauchi, Toshiyuki; and Koike, Shiro, 4,898,727, Cl. 424-76.100.
Koizumi, Yasunori: *See*—
Kanekiyo, Takazumi; Akimoto, Yukitoshi; Kubota, Miho; Fujita, Koichi; and Koizumi, Yasunori, 4,898,685, Cl. 252-353.000.
Koji, Masashi, to Hoshin Kagaku Sangyosho Co., Ltd. Sanitary device. 4,899,057, Cl. 250-436.000.
Kojima, Hiromu: *See*—
Fukahori, Yoshihide; Kojima, Hiromu; Ogino, Akihiko; Suzuki, Shigenobu; and Yoshizawa, Toshikazu, 4,899,323, Cl. 367-176.000.
Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Mochizuki, Kiyofumi; Edagawa, Noboru; and Iwamoto, Yoshinao, 4,899,043, Cl. 250-227.000.
Kolbus GmbH & Co. KG: *See*—
Rossig, Manfred; and Budde, Rolf, 4,898,511, Cl. 414-792.600.
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Klobucar, W. Dirk; Kolich, Charles H.; and Books, Jeffrey T., 4,898,929, Cl. 528-399.000.
Kolle, Erwin; and Klink, Josef, to Daimler Benz AG. Device for changing the inclination of the back-rest of a vehicle seat. 4,898,423, Cl. 297-362.000.
Komada, Hitoshi: *See*—
Ito, Junya; Chiba, Akihiko; Oku, Masuo; and Komada, Hitoshi, 4,897,933, Cl. 34-58.000.
Komag, Inc.: *See*—
Yamashita, Tsutomu T.; Shir, Ching-Cheng; Chen, Tu; and Chen, Ga-Lane, 4,898,774, Cl. 428-336.000.
Komoto, Mitsuo: *See*—
Endo, Hiroshi; Suzuki, Takao; Komoto, Mitsuo; Uekido, Kouzou; and Tokaichi, Tetsuro, 4,898,545, Cl. 439-578.000.
Kompelien, Arlon D.: *See*—
Black, Robert A., Jr.; and Kompelien, Arlon D., 4,899,088, Cl. 315-291.000.
Kondo, Masafumi: *See*—
Hayakawa, Toshiro; Suyama, Takahiro; Takahashi, Kohsei; Kondo, Masafumi; and Yamamoto, Saburo, 4,899,349, Cl. 372-44.000.
Kondo, Mitsuru: *See*—
Kanda, Nobuo; Omura, Haruo; Abe, Yukihiro; and Kondo, Mitsuru, 4,898,941, Cl. 540-596.000.
Kondo, Shinichi: *See*—
Shibahara, Seiji; Okonogi, Tsuneo; Murai, Yasushi; Kudo, Toshiaki; Yoshida, Takashi; Nishihata, Ken; and Kondo, Shinichi, 4,898,858, Cl. 514-206.000.
Kondo, Takeo: *See*—
Kobayashi, Manabu; Suzuki, Kazutoshi; and Kondo, Takeo, 4,898,144, Cl. 123-32.00M.
Kondo, Toshio: *See*—
Hoshino, Masahiro; Kobayashi, Isao; Seko, Kenji; Iwasawa, Naozumi; Akaki, Yuu; and Kondo, Toshio, 4,898,656, Cl. 204-181.100.
Kondziela, James M., to NYNEX. Radio-analogue method of audio presentation and control for audiotex services. 4,899,369, Cl. 379-101.000.
Konica Corporation: *See*—
Fujimaki, Yoshihide; and Takenouchi, Shigeki, 4,898,799, Cl. 430-59.000.
Hirabayashi, Tsugio; and Hamanaka, Izumi, 4,898,372, Cl. 270-53.000.
Kiyohara, Kazuto; Yamazaki, Toshiaki; Harada, Ichiya; Nakadate, Takanori; Noguchi, Kentaro; Nakano, Michiteru; Sakae, Shigeru; and Okuma, Kazuhiro, 4,898,897, Cl. 523-343.000.
Sampei, Takeshi, 4,898,809, Cl. 430-523.000.
Tachibana, Noriki; Nishizeki, Masato; and Kagawa, Nobuaki, 4,898,808, Cl. 430-510.000.
Konig, Johannes, to Gewerkschaft Eisenhutte Westfalia GmbH. Data transmission/reception systems for electro-hydraulic control systems. 4,899,332, Cl. 370-32.000.
Konig, Kurt: *See*—
Klose, Hans-Peter; Konig, Kurt; and Schwartz, Wolfgang, 4,899,068, Cl. 307-494.000.
Konishi, Masahiro; Inuiya, Masafumi; Muramatsu, Akira; and Kato, Masahiro. A system for producing image signals of a subject image by an image sensing device. 4,899,213, Cl. 358-44.000.
Konishi, Masataka; Tomita, Koji; Oka, Masahisa; and Numata, Kenichi, to Bristol-Myers Company. Peptide antibiotics. 4,898,940, Cl. 540-460.000.
Konishi, Yasuhiro: *See*—
Kumanoya, Masaki; Miyatake, Hideshi; Dosaka, Katsumi; and Konishi, Yasuhiro, 4,899,313, Cl. 365-201.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Kobayashi, Kazuhiro; Koboshi, Shigeharu; and Miyaoka, Kazuyoshi, 4,898,807, Cl. 430-378.000.
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Konrad, Bernhard, to Zellweger Uster AG. Process and apparatus for the generation of transmission current signals in an alternating current distribution network. 4,899,062, Cl. 307-3.000.
Konrad, Reinhard: *See*—
Coenen, Hubert; and Konrad, Reinhard, 4,898,990, Cl. 568-438.000.
Kopatz, Nelson E.: *See*—
Ritsko, Joseph E.; Johnson, Walter A.; and Kopatz, Nelson E., 4,898,749, Cl. 427-216.000.
Kopiec, Lawrence J.; and Smith, Franklin S., to Stanadyne Automotive Corp. Process for manufacturing nozzle tip. 4,897,907, Cl. 29-888.400.
Korber AG: *See*—
Wochnowski, Waldemar, 4,898,189, Cl. 131-299.000.
Kornberg, Nurit: *See*—
Becker, Abram; Kornberg, Nurit; and Croitoru, Berta, 4,898,993, Cl. 568-658.000.
Korzik, James L.: *See*—
Bottoms, Stanley; and Korzik, James L., 4,898,547, Cl. 439-652.000.
Koseki, Junichi: *See*—
Tanimoto, Koji; Miura, Kunihiko; and Koseki, Junichi, 4,899,226, Cl. 358-451.000.
Koss Corporation: *See*—
Mlodzikowski, Allan G.; Tsui, Yih-Pyng; and Ku, Hai-Pin, 4,899,388, Cl. 381-77.000.
Kothe, Peter: *See*—
Hulshoff, Hartmut; Kothe, Peter; Luft, Michael; and Schutz, Ulrich, 4,899,287, Cl. 364-470.000.
Kovarik, Karel: *See*—
Fencl, Zdenek; Janda, Frantisek; Kovarik, Karel; Sara, Jiri ; and Tatoun, Antonin, 4,898,006, Cl. 62-48.200.
Kover, Linda J.: *See*—
Leoncavallo, Richard A.; Kover, Linda J.; and Phillips, Gregory R., 4,898,278, Cl. 206-443.000.
Kovosluzba nrodni podnik hlavniho mesta Prahy: *See*—
Fencl, Zdenek; Janda, Frantisek; Kovarik, Karel; Sara, Jiri ; and Tatoun, Antonin, 4,898,006, Cl. 62-48.200.
Kowa Co., Ltd.: *See*—
Fujii, Setsuro; Hattori, Eizou; Hirata, Mitsuteru; Watanabe, Koichiro; Onogi, Kazuhiro; and Nagakura, Masahiko, 4,898,876, Cl. 544-391.000.
Kozai, Takehisa: *See*—
Motomura, Masatoshi; Muramatsu, Ichiro; Okoshi, Noboru; Araki, Yoshitami; Nomura, Kenichiro; Kozai, Takehisa; and Mita, Hiroshi, 4,898,617, Cl. 106-281.100.
Kozbur, Nestor: *See*—
Geyser, Joseph E.; and Kozbur, Nestor, 4,897,980, Cl. 53-128.000.
Kozoe, Katsutoshi; Furuya, Nobuo; Kimura, Shinichi; Okamoto, Yasunari; Kumada, Mitsuyoshi; Sugimoto, Tatsuo; Ueno, Takehiko; Shimizu, Kenjiro; and Itoh, Tsutomu, to Onoda Cement Company, Ltd. Powder coating booth. 4,898,116, Cl. 118-621.000.
Kozu, Isao: *See*—
Kameo, Akitaka; and Kozu, Isao, 4,899,370, Cl. 379-104.000.
Kozuki, Susumu: *See*—
Maeda, Masaya; Takimoto, Hiroyuki; and Kozuki, Susumu, 4,899,231, Cl. 360-33.100.
Kraatz, Udo: *See*—
Buchel, Karl H.; Holmwood, Graham; Kraatz, Udo; Kramer, Wolfgang; Reinecke, Paul; Brandes, Wilhelm; and Stendel, Wilhelm, 4,898,875, Cl. 514-383.000.
Kraft, Inc.: *See*—
Runge, Heinz F., 4,898,280, Cl. 206-604.000.
Zamzow, William H.; and Miller, Anthony M., 4,898,745, Cl. 426-582.000.
Kralik, Donald M.: *See*—
Cohen, Wayne E.; and Kralik, Donald M., 4,898,061, Cl. 84-402.000.
Kramer, Bernhard, to Dornier GmbH. On-board ammunition container. 4,898,070, Cl. 89-34.000.

Kramer, David M., to Hi-Shear Corporation. Multiple channel fiber optic continuity test system. 4,899,045, Cl. 250-227.000.

Kramer, Wolfgang: *See*—
Buchel, Karl H.; Holmwood, Graham; Kraatz, Udo; Kramer, Wolfgang; Reinecke, Paul; Brandes, Wilhelm; and Stendel, Wilhelm, 4,898,875, Cl. 514-383.000.

Kramp, Ekkehard: *See*—
Eggert, Ute; Engel, Andreas; and Kramp, Ekkehard, 4,898,810, Cl. 430-523.000.

Kranz, Walter; and Schnabele, Werner, to Messerschmitt-Bolkow-Blohm GmbH. Missile with adjustable flying controls. 4,898,342, Cl. 244-3.210.

Krasinski, Daniel J.: *See*—
Ketchum, Richard H.; Kleijn, Willem B.; and Krasinski, Daniel J., 4,899,385, Cl. 381-36.000.

Kratochvila, Jan: *See*—
Salajka, Zdenek; Hamrik, Odlrich; Kratochvila, Jan; Gheorghiu, Mihnea; Krivanek, Josef; Sindelar, Pavel; Zaloudik, Petr; Legeza, Vasil; and Jansa, Ladislav, 4,898,847, Cl. 522-110.000.

Kratzer, Hans: *See*—
Dickore, Karlfried; Engels, Hans D.; Kratzer, Hans; and Merz, Walter, 4,898,974, Cl. 562-577.000.

Krauss-Maffei AG: *See*—
Urban, Franz; and Bauer, Adolf, 4,898,714, Cl. 422-133.000.

Krauter, Heinrich: *See*—
Mecke, Norbert; and Krauter, Heinrich, 4,898,486, Cl. 400-241.200.

Krejci, Ivan: *See*—
Kasafirek, Evzen; Rybak, Miroslav; Krejci, Ivan; Sturc, Antonin; Roubalova, Alena; Vanzura, Jiri ; Krepela, Evzen; and Bartik, Michal, 4,898,930, Cl. 530-332.000.

Krepela, Evzen: *See*—
Kasafirek, Evzen; Rybak, Miroslav; Krejci, Ivan; Sturc, Antonin; Roubalova, Alena; Vanzura, Jiri ; Krepela, Evzen; and Bartik, Michal, 4,898,930, Cl. 530-332.000.

Krepski, Larry R.: *See*—
Katritzky, Alan R.; Krepski, Larry R.; Rasmussen, Jerald K.; Heilmann, Steven M.; and Tarr, Richard D., 4,898,923, Cl. 528-73.000.

Kresge, Charles T.: *See*—
Chu, Yung F.; Kresge, Charles T.; and LaPierre, Rene B., 4,899,011, Cl. 585-481.000.

Krieger, Bernhard: *See*—
Hempel, Gerhard; Kennecke, Mario; Krieger, Bernhard; Phillippson, Rainer; Triem, Hermann; and Weber, Alfred, 4,898,693, Cl. 260-397.400.

Kristiansen, Cato, to Renaco AS. Packing for transport of products giving off moisture. 4,898,273, Cl. 206-204.000.

Krivanek, Josef: *See*—
Salajka, Zdenek; Hamrik, Odlrich; Kratochvila, Jan; Gheorghiu, Mihnea; Krivanek, Josef; Sindelar, Pavel; Zaloudik, Petr; Legeza, Vasil; and Jansa, Ladislav, 4,898,847, Cl. 522-110.000.

Krohn, Lisa; and Viemeister, Tucker. Switching mechanism for electrical devices. 4,899,368, Cl. 379-67.000.

Krones AG Hermann Kronseder Maschinenfabrik: *See*—
Schiesl, Hans, 4,898,271, Cl. 198-444.000.

Kruger, Charles H., Jr., to Leland Stanford Junior University, The Board of Trustees of. Method for enhancing chemical reactivity in thermal plasma processes. 4,898,748, Cl. 427-38.000.

KT Technologies Inc.: *See*—
O'Connor, Lawrence J., 4,898,640, Cl. 156-204.000.

Ku, Hai-Pin: *See*—
Mlodzikowski, Allan G.; Tsui, Yih-Pyng; and Ku, Hai-Pin, 4,899,388, Cl. 381-77.000.

Kubo, Masashige; Sakka, Hideo; and Tsutsumi, Yukihiro, to Toyo Soda Manufacturing Co., Ltd. Process for producing brominated acenaphthylene condensates. 4,898,998, Cl. 570-204.000.

Kubota, Kazuo, to Fuji Photo Film Co., Ltd. Method of checking magnetic tape cassette lid opening operation. 4,899,245, Cl. 360-137.000.

Kubota, Miho: *See*—
Kanekiyo, Takazumi; Akimoto, Yukitoshi; Kubota, Miho; Fujita, Koichi; and Koizumi, Yasunori, 4,898,685, Cl. 252-353.000.

Kubota, Terumasa: *See*—
Yamamoto, Takehiko; Kubota, Terumasa; Itoh, Isao; Kato, Hiroyuki; Kikuchi, Terumi; Kawasaki, Hiroko; Mashimoto, Misako; and Oki, Yuji, 4,898,738, Cl. 426-17.000.

Kubota, Tetsuya: *See*—
Takeda, Kazuo; Sekikawa, Nobuyuki; Hayasaka, Katsuhiro; Fujunuma, Chikao; Itoh, Nobuo; and Kubota, Tetsuya, 4,898,837, Cl. 437-31.000.

Kubotatekko Kabushiki Kaisha: *See*—
Kyomen, Junsuke; Sakaguchi, Masayuki; and Fujii, Hiroto, 4,898,705, Cl. 264-242.000.

Kuchar, Norman R.; and Azad, Farzin H., to General Electric Company. Solid state laser gain medium with diamond coating. 4,899,347, Cl. 372-33.000.

Kucza, Jean-Claude: *See*—
Bommier, Christophe; Gimenez, Philippe; Kucza, Jean-Claude; and Rabiet, Jacques, 4,898,646, Cl. 204-1.00T.

Kudo, Hiroaki, to Ikeda Bussan Co., Ltd. Structure for covering seat slide legs. 4,898,417, Cl. 296-97.230.

Kudo, Toshiaki: *See*—
Shibahara, Seiji; Okonogi, Tsuneo; Murai, Yasushi; Kudo, Toshiaki; Yoshida, Takashi; Nishihata, Ken; and Kondo, Shinichi, 4,898,858, Cl. 514-206.000.

Kuhlman, George W., Jr.: *See*—
Chakrabarti, Amiya K.; Kuhlman, George W., Jr.; and Seagle, Stanley R., 4,898,624, Cl. 148-11.50F.

Kuhlmann, Werner, to Siemens Aktiengesellschaft. Optoelectronic coupling system. 4,898,447, Cl. 350-96.200.

Kuhne, Wilhelm: *See*—
Burgdorf, Marten; Kuhne, Wilhelm; and Maus, Udo-Hermann, 4,898,296, Cl. 220-72.000.

Kulite Semiconductor Products, Inc.: *See*—
Kurtz, Anthony D., 4,899,125, Cl. 338-2.000.

Kumada, Mitsuyoshi: *See*—
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Belbel, Elie; Blanchard, Christian; Haury, Andre ; and Lauraire, Michel, 4,899,119, Cl. 335-14.000.

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Pages, Jean, 4,898,140, Cl. 123-510.000.

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Hershberger, Charles L.; Larson, Jeffrey L.; and Reynolds, Patricia A., 4,898,828, Cl. 435-252.300.

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Cohen, Wayne E.; and Kralik, Donald M., 4,898,061, Cl. 84-402.000.

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Latzke, Arno W.; Latzke, Ralf; and Latzke, Gert, 4,898,592, Cl. 604-307.000.

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Bergmann, Andreas; Bartmann, Wilhelm; Beck, Gerhard; and Lau, Hans-Hermann, 4,898,868, Cl. 514-277.000.

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Newman, David A.; Laubengayer, William R.; and Scott, William B., Jr., 4,899,174, Cl. 346-107.00R.

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Belbel, Elie; Blanchard, Christian; Haury, Andre ; and Lauraire, Michel, 4,899,119, Cl. 335-14.000.

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Sentoku, Hideshi; and Asaoka, Takayoshi, 4,897,984, Cl. 53-501.000.

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Kelly, Bryan M.; Fernandes, Jorge M.; Kelly, Matthew F.; and Kelly, Mark R., 4,898,391, Cl. 273-310.000.

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Daniel, Jean-Pierre L. M.; Dupuis, Phillipe; and Alanic, Jean-Luc, 4,899,163, Cl. 343-700.0MS.

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Reilly, James L.; Huber, Ludwig K.; and Leader, Gordon R., 4,899,249, Cl. 361-317.000.

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Menestreau, Alain; Marchand, Maurice; Cornu, Alain; and Le Brun, Richard, 4,899,166, Cl. 343-873.000.

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Lein, Juergen: *See*—
Robbins, Daniel H.; Wirtz, John S.; Lein, Juergen; and Brookmire, Michael A., 4,899,214, Cl. 358-75.000.

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Kruger, Charles H., Jr., 4,898,748, Cl. 427-38.000.

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Lesher, George Y.: *See*—
Bailey, Denis M.; Lesher, George Y.; and D'Ambra, Thomas E., 4,898,880, Cl. 514-406.000.

Leslie, Stewart: *See*—
Miller, Ronald B.; Halpern, Alfred; Leslie, Stewart; and Hofer, Peter, 4,898,729, Cl. 424-80.000.

Leslie, Thomas M.: *See*—
Buckley, Alan; Che, Tessie M.; Leslie, Thomas M.; Stamatoff, James B.; Stuetz, Dagobert E.; and Ulrich, Donald R., 4,898,454, Cl. 350-350.00R.

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Bayetto, Jean-Christophe M.; and Vinatier, Claude J., 4,899,162, Cl. 343-700.0MS.
Le Thuillier, Georgette: *See*—
Dodin, Andre; Siffert, Odile; Le Thuillier, Georgette; and Allard, Patrice, 4,898,815, Cl. 435-7.000.
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Havenstein, Alfred G.; Kahle, Werner; and Schnell, Dagmar, 4,898,740, Cl. 426-106.000.
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Levy, Morris: *See*—
Ovil, Yoel; and Levy, Morris, 4,898,155, Cl. 606-144.000.
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Schwartz, Arthur G.; and Lewbart, Marvin L., 4,898,694, Cl. 260-397.500.
Lewis, Brian, to GSW Inc. Pressure balancing water heater dip tube turbulator attachment. 4,898,150, Cl. 126-361.000.
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Lewis, Michael D.: *See*—
Heck, James V.; and Lewis, Michael D., 4,898,853, Cl. 514-63.000.
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Shuker, Brian; and Huggett, Richard D. J., 4,898,364, Cl. 254-342.000.
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Lewyn, Lanny L., to Brooktree Corporation. Fast high-resolution analog-to-digital converter. 4,899,153, Cl. 341-156.000.
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Engemann, Jurgen, 4,898,557, Cl. 445-49.000.
Lhuillier, Christian, to Framatome. Multiple connection device. 4,898,541, Cl. 439-248.000.
Li, Shuo-Yen R.: *See*—
Gopinath, Bhaskarpillai; and Li, Shuo-Yen R., 4,899,143, Cl. 340-825.500.
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Leon, Robert L., 4,898,362, Cl. 251-129.120.
Licinvest AG: *See*—
Ackeret, Peter, 4,897,946, Cl. 40-513.000.
Lieberman, Walter G. Fluid powered linear slide. 4,898,080, Cl. 92-14.000.
Liebmann, Vern L.: *See*—
Jang, Yue-Teh; Liebmann, Vern L.; Villman, Glenda S.; and Amin, Surendra A., 4,898,591, Cl. 604-282.000.
Liedtke, Kurt: *See*—
Focke, Heinz; and Liedtke, Kurt, 4,898,569, Cl. 493-361.000.
Life Support, Inc.: *See*—
Fuller, Ernest, 4,898,185, Cl. 128-876.000.
Life Support Products, Inc.: *See*—
Fangrow, Thomas F., Jr., 4,898,174, Cl. 128-204.240.
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Lin, Newman K. Method and apparatus to control a beach at an inlet and to maintain the beach. 4,898,495, Cl. 405-73.000.
Lin, You-Jyh; and Kloczewski, Harold, to W. R. Grace & Co.-Conn. Process for the preparation of β-hydroxyketones. 4,898,988, Cl. 568-386.000.
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Lindquist, Donald F., to Eastern Gate, Inc. Infrared diagnostic instrument. 4,899,052, Cl. 250-342.000.
Lindsey Completion Systems, Inc.: *See*—
Lindsey, Hiram E.; and Cole, Paul W., 4,898,243, Cl. 166-290.000.
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Linke, Siegfried W.: *See*—
Mohrmann, Karl H.; Reiser, Wolf; Linke, Siegfried W.; and Zerbes, Rudolf, 4,898,954, Cl. 549-519.000.
Linnemann, Kent A., to Shippers Paper Products Company. Warp-free paperboard slat. 4,898,279, Cl. 206-586.000.
Linossier, Jean-Louis, to Rhone-Poulenc Specialities Chimiques. Heteropolysaccharide solutions stabilized against viscosity loss over temperature and time. 4,898,819, Cl. 435-93.000.
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Kupperman, David S.; and Linzer, Melvin, 4,898,034, Cl. 73-644.000.
Lipson, Benjamin. Self-contained, adjustable disperser and mixer. 4,898,474, Cl. 366-286.000.
Lipson, Ronald B. Paint mask. 4,898,758, Cl. 428-99.000.
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Large, Danny E.; and Tschanen, Mark S., 4,898,303, Cl. 222-65.000.
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Alexeev, Viktor N.; Antiropova, Irina L.; and Lisenko, Artemy L., 4,898,457, Cl. 350-463.000.
Litchford, George B.; and Hulland, Burton L., to Litchstreet Company. Virtual ATCRBS using signals of remote SSR. 4,899,156, Cl. 342-37.000.
Litchstreet Company: *See*—
Litchford, George B.; and Hulland, Burton L., 4,899,156, Cl. 342-37.000.
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Sayles, Scott M.; Livingston, William B.; and Bellinger, Michael P., 4,898,663, Cl. 208-178.000.
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Maitland, Arthur; and Livingstone, Ewan S., 4,899,362, Cl. 372-55.000.
Lockheed Corporation: *See*—
Barish, Herman B., 4,898,503, Cl. 408-230.000.
Lockwood, Arthur H.; and Gonzales, Adela, to Amber Engineering, Inc. Open-tube, benign-environment annealing method for compound semiconductors. 4,898,834, Cl. 437-22.000.
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Sinykin, William B., 4,897,941, Cl. 37-222.000.
Lok, Brent M.: *See*—
Wilson, Stephen T.; Lok, Brent M.; and Flanigen, Edith M., 4,898,660, Cl. 208-114.000.
Loomans, Maurice E.: *See*—
Janusz, John M.; Loomans, Maurice E.; LaHann, Thomas R.; and Kasting, Gerald B., 4,898,887, Cl. 514-617.000.
Loral Electro-Optical Systems Inc.: *See*—
Taylor, Leo O.; and Healey, Fritz W., 4,899,039, Cl. 250-209.000.
Lord Corporation: *See*—
Miller, Lane R., 4,898,264, Cl. 188-275.000.
L'Oreal: *See*—
Gueret, Jean-Louis, 4,898,193, Cl. 132-218.000.
Lang, Gerard; Forestier, Serge; Lagrange, Alain; and Shroot, Braham, 4,898,883, Cl. 514-544.000.
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Lorenzetti, Victor; and Pontes, Manuel, to Wakefield Engineering, Inc. Heat sink. 4,899,210, Cl. 357-81.000.
Loszewski, Raymond C., to AVCO Corporation. Silicon carbide monofilaments for improved composite properties and method. 4,898,778, Cl. 428-368.000.
Lotts, Jury A.: *See*—
Gorodissky, Boris P.; Lotts, Jury A.; and Veretenov, Lev N., 4,898,262, Cl. 184-6.400.
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Love, Carl D. Batting practice device. 4,898,385, Cl. 273-26.00E.
Lowan (Management) Pty. Limited: *See*—
Kelsey, Christopher G., 4,898,666, Cl. 209-425.000.
Lower, Loren D.: *See*—
Kamis, Russell P.; Klosowski, Jerome M.; and Lower, Loren D., 4,898,910, Cl. 524-860.000.
Lowski, Dieter: *See*—
Wolff, Erich; Lowski, Dieter; and Elias, Harry, 4,898,811, Cl. 430-546.000.
Lu, Hsindao: *See*—
Blake, Terence G. W.; and Lu, Hsindao, 4,899,202, Cl. 357-23.700.
Lubarsky, Daniel P., to Pacific Bell. Error correcting code and error correcting circuit using the same. 4,899,340, Cl. 371-37.100.
Lucas Industries public limited company: *See*—
Holmes, Michael, 4,899,282, Cl. 364-431.080.
Luce, Betty M.; and Berdan, Betty L., to Gould, Inc. Process and apparatus for electroplating copper foil. 4,898,647, Cl. 204-13.000.
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Luft, Michael: *See*—
Hulshoff, Hartmut; Kothe, Peter; Luft, Michael; and Schutz, Ulrich, 4,899,287, Cl. 364-470.000.
Lugez, Pierre, to Valois S.A. Method of manufacturing flexible gaskets which withstand chemical agents. 4,898,638, Cl. 156-272.600.
Luling, Martin: *See*—
Clark, Brian; Jundt, Jacques; Luling, Martin; and Ross, Michael O., 4,899,112, Cl. 324-338.000.
Lunt, Audrey T. One-piece infant bunting. 4,897,885, Cl. 2-69.500.
Luperti, Harry E.; Irvine, Robert; and Luvara, Anthony, to Pitney Bowes. Method and apparatus for half folding paper sheets. 4,898,570, Cl. 493-420.000.
Lupoli, Peter J.; Mattis, Donald J.; and Miller, Robert S., to Casco Products Corporation. Lamp fixture for illuminating interior of cigar lighter socket. 4,899,263, Cl. 362-80.000.
Luther, Erich: *See*—
Maelzer, Martin; Dehmel, Rudiger; Higgen, Hans-Hermann; and Gulzow, Andreas, 4,899,104, Cl. 324-158.00F.
Lutz, Robert G.: *See*—
Gergen, William P.; and Lutz, Robert G., 4,898,914, Cl. 525-314.000.

Lutz, Wolfgang; and Happel, Robert, to Daimler-Benz AG. Mixture-compressing internal-combustion engine with a main combustion chamber and an auxiliary combustion chamber. 4,898,136, Cl. 123-269.000.

Luvara, Anthony: *See*—
Luperti, Harry E.; Irvine, Robert; and Luvara, Anthony, 4,898,570, Cl. 493-420.000.

Luzzi, John J.: *See*—
Benjamin, Linda A.; Pastor, Stephen D.; and Luzzi, John J., 4,898,980, Cl. 568-23.000.

Lynch, Jeffrey T.: *See*—
Conley, Jeff A.; and Lynch, Jeffrey T., 4,898,201, Cl. 137-245.500.

Lyons, Bernard J.: *See*—
Sanford, Norman R.; Lyons, Bernard J.; and Yienger, Robert C., 4,899,157, Cl. 342-40.000.

Lyons, James E.: *See*—
Ellis, Paul E., Jr.; and Lyons, James E., 4,898,989, Cl. 568-399.000.

M. E. Cunningham Company: *See*—
Speicher, Edwin W., 4,898,485, Cl. 400-121.000.

Maas, Joachim: *See*—
Becker-Endrigkeit, Horst P.; and Maas, Joachim, 4,898,430, Cl. 303-84.200.
VonHayn, Holger; and Maas, Joachim, 4,898,360, Cl. 251-129.010.

MacFadyen, David J.; Edwards, Robert G.; Wacks, Kenneth P.; and Foley, Daniel J., to Smart House Limited Partnership. Automated appliance and energy distribution control system. 4,899,129, Cl. 340-310.00R.

MacFadyen, David J.; Edwards, Robert G.; Wacks, Kenneth P.; and Foley, Daniel J., to Smart House Limited Partnership. Communication and energy control system for houses. 4,899,217, Cl. 358-86.000.

Mackey, Kevin J.: *See*—
Beard, Marian H.; Caro, Perry A.; Hsiao, Jennifer B.; Mackey, Kevin J.; Sandman, James G., Jr.; Steinbach, Gary R.; and Woods, Donald R., 4,899,136, Cl. 340-706.000.

MacPhail, Margaret G., to International Business Machines Corporation. Method for managing the retention of electronic documents in an interactive information handling system. 4,899,299, Cl. 364-570.000.

MacTaggart, Scott (Holdings) Ltd.: *See*—
Craig, Thomas M., 4,898,344, Cl. 244-116.000.

Madsen, Benni: *See*—
Grobb, Finn; Hvalso, Kurt; and Madsen, Benni, 4,898,056, Cl. 83-689.000.

Madsen, David C.; and Tucker, Hugh N., to Baxter International Inc. Nutritional composition for management of hepatic failure. 4,898,879, Cl. 514-400.000.

Maeda, Masaya; Takimoto, Hiroyuki; and Kozuki, Susumu, to Canon Kabushiki Kaisha. Video camera and separable video recorder/reproducer arrangement. 4,899,231, Cl. 360-33.100.

Maehara, Fuyuki: *See*—
Shibata, Hiroshi; Maehara, Fuyuki; Shintai, Akira; and Kato, Hidetoshi, 4,899,209, Cl. 357-74.000.

Maelzer, Martin; Dehmel, Rudiger; Higgen, Hans-Hermann; and Gulzow, Andreas, to Luther, Erich; and Maelzer, Martin. Adapter for a printed circuit board testing device. 4,899,104, Cl. 324-158.00F.

Maerzke, James T.: *See*—
Daly, Mark D.; Maerzke, James T.; Gengler, Jeffrey R.; and Trick, Robert E., 4,898,158, Cl. 128-79.000.

Mag Instrument, Inc.: *See*—
Maglica, Anthony, 4,899,265, Cl. 362-187.000.

Maggio, Louis: *See*—
Siegel, Seymour; and Maggio, Louis, 4,898,679, Cl. 210-752.000.

Maglica, Anthony, to Mag Instrument, Inc. Miniature flashlight. 4,899,265, Cl. 362-187.000.

Magneti Marelli Electrical Limited: *See*—
West, John G. W., 4,899,074, Cl. 310-154.000.

Magnetic Peripherals Inc.: *See*—
Genheimer, Stephen R., 4,899,234, Cl. 360-78.060.

Magninat, Michel; and Charden, Eric, to Bronton Limited. Spectacles having a frame formed by an elongated cylindrical element comprising deformable bellows. 4,898,460, Cl. 351-114.000.

Maher, Galeb H.; and Stefanik, Susan E., to Sprague Electric Company. Process for manufacturing a ceramic body having multiple barium-titanate phases. 4,898,844, Cl. 501-138.000.

Mahmoud, Issa S., to International Business Machines Corporation. Anodic coatings on aluminum for circuit packaging. 4,898,651, Cl. 204-29.000.

Mahoney, Gregory, to Eastman Kodak Company. Dual purpose cleaning apparatus. 4,899,198, Cl. 355-297.000.

Mahoney, Gregory P., to Eastman Kodak Company. Copy apparatus having a non-integrally sized transfer device. 4,899,196, Cl. 355-271.000.

Maignan, Jean; Lang, Gerard; Malle, Gerard; and Vingler, Philippe, to L'Oreal. Bicyclic aromatic compounds, a process for their preparation and their use in cosmetics and human and veterinary medicine. 4,898,864, Cl. 514-237.500.

Maingueneau, Gerard, to Mecanique des 3 Moutiers. Conical screw auger machine for splitting a log of wood. 4,898,220, Cl. 144-194.000.

Maitland, Arthur; and Livingstone, Ewan S., to EEV Limited. Metal vapor laser with improved laser medium formation. 4,899,362, Cl. 372-55.000.

Maix, Anton. Convertible textile fire block material. 4,898,757, Cl. 428-97.000.

Maj, Philippe; Blondel, Philippe; and Cuzin, Daniel, to Atochem. Transparent copolyamide from oligomeric amide and cycloaliphatic diamine and process for the production thereof. 4,898,896, Cl. 528-323.000.

Majumdar, Ramendra N.: *See*—
Harwood, H. James; Majumdar, Ramendra N.; and Yang, Shih-Liang, 4,898,915, Cl. 525-326.700.

Makhteshim Chemical Works, Ltd.: *See*—
Ovadia, David; and Mandler, Ernestine, 4,898,942, Cl. 544-243.000.

Makikawa, Shinji: *See*—
Ogihara, Masahiro; Makikawa, Shinji; and Iguchi, Masaaki, 4,898,641, Cl. 156-601.000.

Malle, Gerard: *See*—
Maignan, Jean; Lang, Gerard; Malle, Gerard; and Vingler, Philippe, 4,898,864, Cl. 514-237.500.

Mallinckrodt, Inc.: *See*—
Jang, Yue-Teh; Liebmann, Vern L.; Villman, Glenda S.; and Amin, Surendra A., 4,898,591, Cl. 604-282.000.
Varwig, John W., 4,898,976, Cl. 564-112.000.

MAN Nutzfahrzeuge GmbH: *See*—
Hagin, Faust; and Martini, Stefan, 4,897,996, Cl. 60-468.000.

Mancewicz, James M.; and Bosworth, William R., Jr., to Grand Rapids Controls, Inc. Control cable. 4,898,046, Cl. 74-502.500.

Mandalia, Baiju D.: *See*—
Davis, Gordon T.; and Mandalia, Baiju D., 4,899,366, Cl. 375-14.000.

Mandler, Ernestine: *See*—
Ovadia, David; and Mandler, Ernestine, 4,898,942, Cl. 544-243.000.

Manitowoc Company, Inc., The: *See*—
Taylor, Richard S., 4,898,002, Cl. 62-71.000.

Mannl, Reinhard, to Schott Ruhrglas GmbH. Glass vessel in particular, an ampoule and a method for treating the glass vessel. 4,898,605, Cl. 65-113.000.

Manschwetus, Helmut, to Thyssen Industrie AG Henschel. Arrangement for securing a cap to the end of a supporting body of a hammer mill rotor. 4,898,334, Cl. 241-194.000.

Manske, Bradley W.; and Weber, John M., to Montgomery Elevator Company. Elevator self-diagnostic control system. 4,898,263, Cl. 187-133.000.

Mantovani, John C.: *See*—
Gunn, William L.; Heath, William D., Jr.; and Mantovani, John C., 4,898,564, Cl. 453-3.000.

Manyik, Robert M.; Brockwell, Jonathan L.; and Kendall, John E., to Union Carbide Chemicals and Plastics Company Inc. Process for oxydehydrogenation of ethane to ethylene. 4,899,003, Cl. 585-313.000.

Manzin, Maurizio: *See*—
Puozzo, Luciano; and Manzin, Maurizio, 4,899,024, Cl. 219-10.410.

Marangone, Nereo: *See*—
Colli, Luigi; Badiali, Roberto; and Marangone, Nereo, 4,899,286, Cl. 364-470.000.

Marc, Pierre A.: *See*—
Szucs, Stephen S.; Quakenbush, Laura S.; and Marc, Pierre A., 4,898,609, Cl. 71-105.000.

Marchand, Maurice: *See*—
Menestreau, Alain; Marchand, Maurice; Cornu, Alain; and Le Brun, Richard, 4,899,166, Cl. 343-873.000.

Marchant, Jeffrey D., to Motorola, Inc. Method and device for a M-out-of-N detection scheme. 4,899,159, Cl. 342-90.000.

Marchetti, Augusto. Nozzle support head for ink-jet marking devices. 4,899,179, Cl. 346-140.00R.

Marcus, David: *See*—
Diman, Charles; Marcus, David; Mitchell, Philip; and Sachs, Samuel B., 4,898,667, Cl. 210-138.000.

Mardon, Paul F., to Pulsar Light of Cambridge Ltd. Spotlight and control system therefor. 4,899,267, Cl. 362-277.000.

Marechal, Claude; and Schmuckle, Christian, to Eastman Kodak Company. Magnetic information-recording element and method of manufacture. 4,899,037, Cl. 235-493.000.

Margerum, David E.: *See*—
Shoen, Jerry W.; and Margerum, David E., 4,898,626, Cl. 148-111.000.

Marhefka, Matthew: *See*—
Cohen, Joel B.; and Marhefka, Matthew, 4,898,300, Cl. 220-334.000.

Marianelli, Giorgio: *See*—
Barbieri, Raul; and Marianelli, Giorgio, 4,899,324, Cl. 368-76.000.

Markhoff-Matheny, Carole J.: *See*—
Hay, John; Markhoff-Matheny, Carole J.; and Swanson, Brian E., 4,898,597, Cl. 51-298.000.

Marlin Firearms Company, The: *See*—
Osborne, William E., 4,897,951, Cl. 42-70.060.

Marotta Scientific Controls, Inc.: *See*—
Worden, Donald A., 4,897,959, Cl. 49-18.000.

Marracino, Charles R.: *See*—
Hoover, John W.; and Marracino, Charles R., 4,898,759, Cl. 428-99.000.

Marsili, Leonardo, to Rifar S.r.L. Method for preparing crystalline cefadroxil monohydrate. 4,898,938, Cl. 540-230.000.

Marten, Victor: *See*—
Hawkins, Brian; Greenberg, Jerald; Alon, Ofer; Marten, Victor; Banyai, Edward; Edwards, Jennifer A.; Banyai, David M.; Sanchez, Juan C.; Sitnik, Eran; and Yozzo, Joseph A., 4,898,182, Cl. 128-707.000.

Martin Engineering Company: *See*—
Swinderman, R. Todd; Bowman, Michael A.; and Goldbeck, Larry J., 4,898,272, Cl. 198-841.000.

Martini, Stefan: *See*—
Hagin, Faust; and Martini, Stefan, 4,897,996, Cl. 60-468.000.

Maruyama, Akio: *See—*
Sugata, Masao; Den, Tohru; Ito, Susumu; Hirabayashi, Keiji; Ikoma, Keiko; Kurihara, Noriko; Osabe, Kuniji; Takeuchi, Tatsuo; Satomura, Hiroshi; Oguchi, Yoshihiro; Maruyama, Akio; and Saito, Keishi, 4,898,798, Cl. 430-58.000.

Maruyama, Atsushi, to Olympus Optical Co., Ltd. Exposure control apparatus for lens-shutter type camera. 4,899,191, Cl. 354-421.000.

Maruyama, Toshio; Oda, Yukio; and Yamaguchi, Syoji, to Toyoda Koki Kabushiki Kaisha. Apparatus for truing a grinding wheel. 4,897,967, Cl. 51-165.870.

Marz, Horst F., to C-I-L Inc. Polymeric film enveloped explosive cartridges and their manufacture and use. 4,898,066, Cl. 86-20.100.

Masaki, Naoki; and Yoshida, Masayuki, to Pioneer Electronic Corporation. Random reproducing system for disk player. 4,899,331, Cl. 369-32.000.

Masaoka, Toshi: *See—*
Teshima, Toshio; Kitagawa, Tooru; Suzuki, Mikio; Masaoka, Toshi; Mori, Takashi; and Okimoto, Kazutaka, 4,898,226, Cl. 168-415.000.

Mashimoto, Misako: *See—*
Yamamoto, Takehiko; Kubota, Terumasa; Itoh, Isao; Kato, Hiroyuki; Kikuchi, Terumi; Kawasaki, Hiroko; Mashimoto, Misako; and Oki, Yuji, 4,898,738, Cl. 426-17.000.

Mason, Lawrence J.: *See—*
Hammond, Thomas J.; and Mason, Lawrence J., 4,899,087, Cl. 315-241.00P.

Masonry Processes, Inc.: *See—*
Balhorn, Milo G., 4,897,969, Cl. 51-418.000.

Massachusetts Institute of Technology: *See—*
Mathiowitz, Edith; Langer, Robert S.; Warshawsky, Abraham; and Edelman, Elazar, 4,898,734, Cl. 424-426.000.

Masuda, Takahiro, to Yazaki Corporation. Vehicle-meter-housing mounting brackets. 4,898,350, Cl. 248-27.100.

Masuda, Tomohiko: *See—*
Kitano, Hirohisa; Saito, Itaru; Matsubara, Ken; Shingaki, Kouichi; and Masuda, Tomohiko, 4,899,183, Cl. 346-154.000.

Masumori, Tadaaki: *See—*
Ooba, Yuji; Sugihara, Shigeo; Masumori, Tadaaki; and Shiwa, Shinichi, 4,899,224, Cl. 358-332.000.

Masuoka, Shigeru; Doi, Hiroshi; and Honda, Yoshihiro, to Nippon Oil and Fats Co., Ltd. Antifouling pain having a polyacrylate component with pendent silyl or siloxane groups. 4,898,895, Cl. 523-122.000.

Mathiowitz, Edith; Langer, Robert S.; Warshawsky, Abraham; and Edelman, Elazar, to Massachusetts Institute of Technology. Polymer composite for controlled release or membrane formation. 4,898,734, Cl. 424-426.000.

Matra Manurhin Defense: *See—*
Lechelle, Alain; Guidat, Thierry; and Bruckert, Serge, 4,897,950, Cl. 42-62.000.

Matsubara, Ken: *See—*
Kitano, Hirohisa; Saito, Itaru; Matsubara, Ken; Shingaki, Kouichi; and Masuda, Tomohiko, 4,899,183, Cl. 346-154.000.

Matsubara, Takashi: *See—*
Okuda, Hironori; and Matsubara, Takashi, 4,899,145, Cl. 341-15.000.

Matsuda, Akira: *See—*
Shiga, Syoji; Matsuda, Akira; Shibata, Nobuyuki; and Akasaka, Kiichi, 4,898,318, Cl. 228-183.000.

Matsuda, Kenichi: *See—*
Fujita, Toshihiro; Ohya, Jun; Matsuda, Kenichi; and Serizawa, Hiroyuki, 4,899,360, Cl. 372-50.000.

Matsueda, Hirokazu: *See—*
Kinoshita, Mitsuo; Imamura, Shigeru; and Matsueda, Hirokazu, 4,898,964, Cl. 558-416.000.
Kinoshita, Mitsuo; Imamura, Shigeru; and Matsueda, Hirokazu, 4,898,965, Cl. 558-416.000.

Matsui, Norio: *See—*
Osaka, Takaaki; Matsui, Norio; Susaki, Shinichi; and Egawa, Yutaka, 4,897,918, Cl. 29-830.000.

Matsumoto, Hiroo: *See—*
Isoda, Sumiro; Aibara, Shunzo; Miwa, Tamotsu; Fujiwara, Hiroyuki; Yokohama, Shuichi; and Matsumoto, Hiroo, 4,898,943, Cl. 544-251.000.

Matsumoto, Hitoshi: *See—*
Sato, Toshio; Matsumoto, Hitoshi; and Kakegawa, Hisao, 4,898,890, Cl. 514-685.000.

Matsumoto, Junichiro; Shimada, Mitsuhiro; and Yamamoto, Yoichi, to Sharp Kabushiki Kaisha. Paper support mechanism in a printer. 4,898,489, Cl. 400-656.000.

Matsumoto, Yoshitaka: *See—*
Iizuka, Yunosuke; Ishii, Takashi; Mukawa, Yoshihiro; Nagata, Kouji; Matsumoto, Yoshitaka; and Murakami, Osamu, 4,899,277, Cl. 364-422.000.

Matsumura, Mitsuie; Tanaka, Toshihide; Urushibata, Hiroaki; and Sato, Kazunao, to Mitsubishi Denki Kabushiki Kaisha. Fuel cell device. 4,898,793, Cl. 429-38.000.

Matsuoka, Toshihiro: *See—*
Nishimura, Eiji; Nobumoto, Kazutoshi; Matsuoka, Toshihiro; Tsuyama, Toshiaki; and Sotoyama, Kaoru, 4,898,138, Cl. 123-399.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Arai, Akihiko; Okada, Kazuichi; Kamo, Tetsuo; and Shiota, Eiji, 4,899,028, Cl. 219-10.493.
Fujita, Toshihiro; Ohya, Jun; Matsuda, Kenichi; and Serizawa, Hiroyuki, 4,899,360, Cl. 372-50.000.
Ichikawa, Toru; Kodama, Shuichi; Kagoroku, Nobuo; Ito, Shotaro; and Honda, Shuichi, 4,898,003, Cl. 62-244.000.
Kameo, Akitaka; and Kozu, Isao, 4,899,370, Cl. 379-104.000.
Takewa, Hiroyuki; Serikawa, Mitsuhiko; Ishikawa, Seiichi; Usuki, Sawako; Kimura, Yoichi; and Obata, Shuichi, 4,899,390, Cl. 381-154.000.

Matsushita Electric Works, Ltd.: *See—*
Osada, Koji; Date, Haruyuki; Saihara, Yasuhiro; Yamauchi, Toshiyuki; and Koike, Shiro, 4,898,727, Cl. 424-76.100.
Saeki, Takashi; Nii, Takayuki; Fukui, Hirotake; Mishina, Toshiro; Nakano, Haruo; and Sakakibara, Hitoshi, 4,899,158, Cl. 342-44.000.

Mattis, Donald J.: *See—*
Lupoli, Peter J.; Mattis, Donald J.; and Miller, Robert S., 4,899,263, Cl. 362-80.000.

Matushita, Fumio; Akashi, Kageyasu; and Sekine, Satoshi, to Asahi Kasei Kogyo Kabushiki Kaisha. Titanate powder and process for producing the same. 4,898,843, Cl. 501-136.000.

Maus, Udo-Hermann: *See—*
Burgdorf, Marten; Kuhne, Wilhelm; and Maus, Udo-Hermann, 4,898,296, Cl. 220-72.000.

Mauser-Werker GmbH: *See—*
Burgdorf, Marten; Kuhne, Wilhelm; and Maus, Udo-Hermann, 4,898,296, Cl. 220-72.000.

Maxon Corporation: *See—*
Rollins, Marvin J., 4,898,393, Cl. 277-27.000.

Maxville, David C.; Meade, Kenneth R., Sr.; and Beal, David G., to Boeing Company, The. Hole angularity gauge. 4,897,928, Cl. 33-534.000.

May, James B.: *See—*
Dosaj, Vishu D.; May, James B.; and Jeffress, Robert D., 4,898,712, Cl. 420-578.000.

Maynard-Nenno, Pamela M.: *See—*
Einolf, Charles W., Jr.; Shutterly, Harold B.; Sun, Shan C.; Gonnam, Russel W.; Ray, Roger E.; Koch, Karl C.; and Maynard-Nenno, Pamela M., 4,899,383, Cl. 380-48.000.

Mays, Charles D.: *See—*
Niven, Benjamin F., Jr.; and Mays, Charles D., 4,898,188, Cl. 131-296.000.

Mazda Motor Corporation: *See—*
Nishimura, Eiji; Nobumoto, Kazutoshi; Matsuoka, Toshihiro; Tsuyama, Toshiaki; and Sotoyama, Kaoru, 4,898,138, Cl. 123-399.000.
Sakurai, Yoshihiko, 4,898,005, Cl. 62-115.000.

Mazodier, Francois; and Paulhac, Rene , to Clecim. Installation for levelling a metal strip. 4,898,013, Cl. 72-165.000.

McBeth, James B., to Teleflex Incorporated. Self-bleeding hydraulic pumping apparatus. 4,898,077, Cl. 91-505.000.

McBride, John F.: *See—*
Cry, John W.; Kirkham, Randy R.; McBride, John F.; Simmons, Carver S.; and Gee, Glendon W., 4,899,047, Cl. 250-227.000.

McCardle, Thomas A.: *See—*
McLaughlin, John E.; and McCardle, Thomas A., 4,898,316, Cl. 227-120.000.

McClure, Richard J., to Eastman Kodak Company. Biasing for a UMR head. 4,899,240, Cl. 360-113.000.

McCowan, William: *See—*
Failla, Charles C.; Pouring, Andrew A.; Rankin, Bruce; di Priolo, Carlo L.; McCowan, William; and Gosewisch, Dennis, 4,898,135, Cl. 123-263.000.

McCracken, James R., to United Technologies Corporation. Turbine balance arrangement with integral air passage. 4,898,514, Cl. 416-95.000.

McCrindle, John A.; Steiner, Antony F.; and Jackson, Andrew M., to General Electric Company, p.l.c., The. Transaction system. 4,899,036, Cl. 235-380.000.

McCullough, Francis P., Jr.; Hotchkiss, Robert L.; Snelgrove, R. Vernon; Hall, David M.; and McCullough, Jacqueline R., to Dow Chemical Company, The. Sound and thermal insulation. 4,898,783, Cl. 428-408.000.

McCullough, Jacqueline R.: *See—*
McCullough, Francis P., Jr.; Hotchkiss, Robert L.; Snelgrove, R. Vernon; Hall, David M.; and McCullough, Jacqueline R., 4,898,783, Cl. 428-408.000.

McCullum, John L.: *See—*
Hamdy, Esmat Z.; Mohsen, Amr M.; and McCullum, John L., 4,899,205, Cl. 357-51.000.

McDermott, William C., to Deutz-Allis Corporation. Seed singulator for agricultural planter. 4,898,108, Cl. 111-185.000.

McDonald, Edward; and Salmon, Roger, to Imperial Chemical Industries PLC. Cyclopropane derivatives. 4,898,968, Cl. 560-124.000.

McDonald, William H. Laminar air flow exterior adjustable rearview mirror. 4,898,458, Cl. 350-584.000.

McDonnell Douglas Corporation: *See—*
McGovern, Thomas; and Whitesides, Robert B., 4,898,234, Cl. 165-170.000.
Udd, Eric, 4,898,468, Cl. 356-345.000.

McDonough, Suellen, to Academy of Applied Science, The. Suction catheter and storage holder and package. 4,898,586, Cl. 604-171.000.

McGaw, Stephen A.: *See—*
Lee, Chinmei C.; and McGaw, Stephen A., 4,899,373, Cl. 379-207.000.

McGlew, John J.; and McGlew, John J., Jr. Cargo ship having stowage space for floatable self-propelled warehouses. 4,898,112, Cl. 114-255.000.

McGlew, John J., Jr.: *See*—
McGlew, John J.; and McGlew, John J., Jr., 4,898,112, Cl. 114-255.000.

McGovern, Thomas; and Whitesides, Robert B., to McDonnell Douglas Corporation. Air heat exchanger. 4,898,234, Cl. 165-170.000.

McGrath, Daniel T., to United States of America, Air Force. Slot coupled microstrip constrained lens. 4,899,164, Cl. 343-754.000.

McGuire, Michael: *See*—
Liggett, Louis; McGuire, Michael; Palmer, Marcia; and DeGiacomo, Ralph, 4,898,744, Cl. 426-557.000.

McGuire, Robert M. Tree bracing apparatus. 4,897,956, Cl. 47-43.000.

McLaughlin, Donald: *See*—
Jordan, Norman M.; and McLaughlin, Donald, 4,898,097, Cl. 102-283.000.

McLaughlin, John E.; and McCardle, Thomas A., to Senco Products, Inc. Fastener magazine and guide device. 4,898,316, Cl. 227-120.000.

McMenamin, Gregory R.: *See*—
Kime, James A.; and McMenamin, Gregory R., 4,898,333, Cl. 239-657.000.

McMillan, Roy: *See*—
Clark, Maxwell J.; McMillan, Roy; and Ogden, Frank J., 4,898,251, Cl. 175-27.000.

McNeilab, Inc.: *See*—
Carson, John R., 4,898,889, Cl. 514-654.000.

McQuade, John M., to Minnesota Mining and Manufacturing Company. Method of reducing average data rate in rotating mirror laser recorder. 4,899,176, Cl. 346-108.000.

McVannel, Donald E.: *See*—
Baile, Gnaneshwar R.; McVannel, Donald E.; Reading, Kirsten L.; and Hall, Ginger L., 4,898,961, Cl. 556-479.000.

Meade, Kenneth R., Sr.: *See*—
Maxville, David C.; Meade, Kenneth R., Sr.; and Beal, David G., 4,897,928, Cl. 33-534.000.

Mears, Eric L.: *See*—
Freytsis, Avrum; Hertel, Richard J.; and Mears, Eric L., 4,899,059, Cl. 250-492.200.

Mecanique des 3 Moutiers: *See*—
Maingueneau, Gerard, 4,898,220, Cl. 144-194.000.

Mecanique Generale J. DeVille Et Cie: *See*—
Champagnac, Paul R., 4,898,401, Cl. 280-605.000.

Mecke, Norbert; and Krauter, Heinrich, to Pelikan Aktiengesellschaft. Thermal transfer ribbon, especially for impressions on rough paper. 4,898,486, Cl. 400-241.200.

Medical Engineering Corporation: *See*—
Daly, Mark D.; Maerzke, James T.; Gengler, Jeffrey R.; and Trick, Robert E., 4,898,158, Cl. 128-79.000.

Medical Graphics Corporation: *See*—
Crawford, A. Gerrit; and Morrison, Douglas C., 4,898,465, Cl. 356-311.000.

Medical Titanium Corporation: *See*—
Hofmann, Robert F.; and Waldock, David B., 4,898,170, Cl. 606-166.000.

MedInnovations, Inc.: *See*—
Fischell, Robert E.; and Fischell, Tim A., 4,898,575, Cl. 604-22.000.

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Daglow, Terry D.; and Sandstrom, Richard D., 4,898,173, Cl. 128-419.00P.

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Shibahara, Seiji; Okonogi, Tsuneo; Murai, Yasushi; Kudo, Toshiaki; Yoshida, Takashi; Nishihata, Ken; and Kondo, Shinichi, 4,898,858, Cl. 514-206.000.

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Fetzer, Gunter; and Meinert, Thomas, 4,899,041, Cl. 250-222.100.

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Oldendorf, Christian; Melcher, Franz-Josef; and Berg, Christoph, 4,898,253, Cl. 177-25.130.

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Chan, Kwan W., 4,898,090, Cl. 99-306.000.

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Meneely, Vincent A. Anti-lash adjuster. 4,898,128, Cl. 123-90.120.

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Heck, James V.; and Lewis, Michael D., 4,898,853, Cl. 514-63.000.
Katdare, Ashok V., 4,898,736, Cl. 424-465.000.

Mercurio, Benardo: *See*—
Miller, William D.; Stiff, Omar L.; and Mercurio, Benardo, 4,897,910, Cl. 29-426.300.

Merlin Gerin: *See*—
Tripodi, Paul, 4,899,246, Cl. 361-44.000.

Merritt, Dan. Internal combustion engine with catalytic ignition. 4,898,126, Cl. 123-53.00A.

Mertinooke, Peter E.: *See*—
Halberstadt, Louis; Mertinooke, Peter E.; Perry, Joseph V.; and Muessel, Dan C., 4,898,760, Cl. 428-122.000.

Merton, Henry A., to Cing Corporation. Method and system for objectively grading and identifying coins. 4,899,392, Cl. 382-1.000.

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Dickore, Karlfried; Engels, Hans D.; Kratzer, Hans; and Merz, Walter, 4,898,974, Cl. 562-577.000.

Messerschmitt-Boelkow-Blohm GmbH: *See*—
Hofmann, Hans; and Wendt, Hartmut, 4,898,699, Cl. 264-43.000.

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Ermert, Klaus; and Hutter, Horst, 4,898,096, Cl. 102-221.000.
Kranz, Walter; and Schnabele, Werner, 4,898,342, Cl. 244-3.210.
Oefner, Walter, 4,898,756, Cl. 428-34.100.

Messroghli, Hossein; and Boebel, Manfred, to Richard Wolf GmbH. Instrument for holding surgical needles. 4,898,157, Cl. 606-147.000.

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Brehm, Lothar, 4,898,028, Cl. 73-147.000.

Metallwarenfabrik GmbH & Co. KG: *See*—
Pontoppidan, Eskild; and Fleischer, Willy, 4,898,103, Cl. 108-144.000.

Metcalf, Jeffrey D., to Sundstrand Corporation. Torque limiter. 4,898,265, Cl. 192-8.00R.

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Gruenbaum, William T.; Mey, William; and Robinson, Kelly S., 4,898,797, Cl. 430-51.000.

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Meyer, Lutz: *See*—
Lang, Cestmir; and Meyer, Lutz, 4,898,629, Cl. 148-12.00B.

Michael, Keith W.: *See*—
Haluska, Loren A.; Michael, Keith W.; and Tarhay, Leo, 4,898,907, Cl. 524-490.000.

Michel, John B., to Du Pont de Nemours, E. I., and Company. Process for making 90 k superconductors using a spray dried oxalate precursor. 4,898,851, Cl. 505-1.000.

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Nakama, Katsuhiko; Ninomiya, Hiroshi; Michishige, Toru; and Itsuki, Fumiaki, 4,898,549, Cl. 439-701.000.

Micron Technology, Inc.: *See*—
Corbett, Tim J.; and Wood, Alan G., 4,899,107, Cl. 324-158.00F.

Mid-West Conveyor Co., Inc.: *See*—
Summa, Gareth D., 4,898,099, Cl. 104-172.400.

Miguchi, Akio: *See*—
Tamba, Shinichi; Miyazaki, Takeshi; and Miguchi, Akio, 4,898,040, Cl. 74-15.630.

Mihara, Takahisa: *See*—
Tochiyama, Kazunori; and Mihara, Takahisa, 4,899,237, Cl. 360-98.020.

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Igata, Akitosi; and Mikoda, Tamio, 4,898,850, Cl. 503-227.000.

Milch, James R., to Eastman Kodak Company. Spectrometer apparatus for self-calibrating color imaging apparatus. 4,898,467, Cl. 356-328.000.

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Yip, Kin-Fai, 4,898,824, Cl. 435-180.000.

Miller, Anthony M.: *See*—
Zamzow, William H.; and Miller, Anthony M., 4,898,745, Cl. 426-582.000.

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Lupoli, Peter J.; Mattis, Donald J.; and Miller, Robert S., 4,899,263, Cl. 362-80.000.

Miller, Ronald B.; Halpern, Alfred; Leslie, Stewart; and Hofer, Peter, to Euroceltique, S.A. Treatment of hypertension, compounds and compositions for antihypertension and diuresis. 4,898,729, Cl. 424-80.000.

Miller, Stephen A.: *See*—
Montagna, John A.; Irving, Gary; Farrell, Lee; Cross, Gerald; and Miller, Stephen A., 4,899,292, Cl. 364-521.000.

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Gray, Coy J., 4,897,989, Cl. 57-239.000.

Mills, Edward A.: *See*—
Jones, George B.; and Mills, Edward A., 4,898,012, Cl. 72-11.000.

Mills, Perry A.; and DiMarco, Joel. Quick-change vise. 4,898,371, Cl. 269-136.000.

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Mina, George L.: *See*—
Livingston, Glen L.; Borges, John; and Mina, George L., 4,898,994, Cl. 568-720.000.

Minami, Kenji; Yatagai, Hidetaka; and Sano, Yoshinori, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Decorative laminated sheet and decorative overlaid plywood faced with thermosetting resin. 4,898,788, Cl. 428-481.000.

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Brown, Josephine S.; and Sipinen, Alan J., 4,898,762, Cl. 428-152.000.
Doree, Richard H.; and Ugro, Josef V., Jr., 4,898,633, Cl. 156-145.000.
Hubbard, Lloyd C.; and Clausen. Earl W., 4,898,518, Cl. 417-360.000.
Katritzky, Alan R.; Krepski, Larry R.; Rasmussen, Jerald K.; Heilmann, Steven M.; and Tarr, Richard D., 4,898,923, Cl. 528-73.000.
McQuade, John M., 4,899,176, Cl. 346-108.000.
Skrtic, Tom; and Juntunen, Timothy J., 4,898,275, Cl. 206-330.000.
Williams, Bruce E., 4,898,945, Cl. 546-95.000.

Minolta Camera Kabushiki Kaisha: *See*—
Ito, Masazumi; Nishimori, Kadotaro; and Oyabu, Masaaki, 4,899,140, Cl. 340-756.000.
Kitano, Hirohisa; Saito, Itaru; Matsubara, Ken; Shingaki, Kouichi; and Masuda, Tomohiko, 4,899,183, Cl. 346-154.000.
Tsuji, Kenji; and Ichikawa, Tsutomu, 4,899,092, Cl. 313-594.000.

Mintel, Thomas E.: *See*—
Misevich, Kenneth W.; and Mintel, Thomas E., 4,897,937, Cl. 36-43.000.

Misawa, Toshiyuki: *See*—
Morozumi, Shinji; Misawa, Toshiyuki; and Nakazawa, Yoshio, 4,899,141, Cl. 340-784.000.

Misevich, Kenneth W.; and Mintel, Thomas E., to Colgate-Palmolive Company. Non-slip insole base. 4,897,937, Cl. 36-43.000.

Mishina, Toshiro: *See*—
Saeki, Takashi; Nii, Takayuki; Fukui, Hirotake; Mishina, Toshiro; Nakano, Haruo; and Sakakibara, Hitoshi, 4,899,158, Cl. 342-44.000.

Mita, Hiroshi: *See*—
Motomura, Masatoshi; Muramatsu, Ichiro; Okoshi, Noboru; Araki, Yoshitami; Nomura, Kenichiro; Kozai, Takehisa; and Mita, Hiroshi, 4,898,617, Cl. 106-281.100.

Mitchell, Philip: *See*—
Diman, Charles; Marcus, David; Mitchell, Philip; and Sachs, Samuel B., 4,898,667, Cl. 210-138.000.

Mitek Surgical Products, Inc.: *See*—
Gatturna, Roland F.; Nicholson, James E.; and O'Leary, James, 4,898,156, Cl. 606-72.000.

Mito, Kunihiro: *See*—
Ogura, Eiji; Mito, Kunihiro; and Arai, Shoji, 4,898,970, Cl. 560-236.000.

Mitome, Yukio: *See*—
Ichikawa, Masako; and Mitome, Yukio, 4,899,386, Cl. 381-43.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Aikawa, Masatoshi; Nakagawa, Hiromasa; and Umeki, Tsunenori, 4,899,066, Cl. 307-45.200.
Hoshino, Masahiro; Kobayashi, Isao; Seko, Kenji; Iwasawa, Naozumi; Akaki, Yuu; and Kondo, Toshio, 4,898,656, Cl. 204-181.100.
Itai, Kosaku, 4,899,250, Cl. 361-341.000.
Kawai, Hiroyuki; and Ishihara, Kazuya, 4,899,127, Cl. 340-146.200.
Kitamura, Yutaka, 4,898,038, Cl. 74-6.000.
Kumanoya, Masaki; Miyatake, Hideshi; Dosaka, Katsumi; and Konishi, Yasuhiro, 4,899,313, Cl. 365-201.000.
Matsumura, Mitsuie; Tanaka, Toshihide; Urushibata, Hiroaki; and Sato, Kazunao, 4,898,793, Cl. 429-38.000.
Sakurai, Hiromi; and Akasaka, Yoichi, 4,899,206, Cl. 357-67.000.
Takada, Mitsuyuki; Takasago, Hayato; and Onishi, Yoichiro, 4,898,805, Cl. 430-315.000.
Terane, Hideyuki; and Ishihara, Kazuya, 4,899,304, Cl. 364-745.000.
Uevama, Satoshi; and Isoda, Satoru, 4,898,833, Cl. 436-63.000.

Mitsubisni Gas Chemical Company, Inc.: *See*—
Yabe, Seizo; and Yamazaki, Kunio, 4,898,706, Cl. 264-266.000.

Mitsubishi Kinzoku Kabushiki Kaisha: *See*—
Takahashi, Yutaka, 4,897,966, Cl. 51-131.300.
Tsujimura, Osamu; Arai, Tatsuo; Nakayama, Masaaki; and Okawa, Masayuki, 4,898,499, Cl. 407-42.000.

Mitsubishi Metal Corporation: *See*—
Doi, Hidekazu; and Yabuki, Ritsue, 4,898,794, Cl. 429-59.000.

Mitsubishi Petrochemical Co., Ltd.: *See*—
Kanekiyo, Takazumi; Akimoto, Yukitoshi; Kubota, Miho; Fujita, Koichi; and Koizumi, Yasunori, 4,898,685, Cl. 252-353.000.

Mitsubishi Rayon Co., Ltd.: *See*—
Yamamoto, Naoki; Mori, Hiroshi; Nakata, Akira; and Suehiro, Misayo, 4,898,918, Cl. 525-425.000.

Mitsuhashi, Susumu: *See*—
Shibahara, Seiji; Okonogi, Tsuneo; Murai, Yasushi; Kudo, Toshiaki; Yoshida, Takashi; Nishihata, Ken; and Kondo, Shinichi, 4,898,858, Cl. 514-206.000.

Mitsui Kinzoku Kogyo Kabushiki Kaisha: *See*—
Satoh, Seiki, 4,898,415, Cl. 292-347.000.
Yamada, Shinjiro, 4,898,414, Cl. 292-337.000.

Mitsui Toatsu Chemicals, Incorporated: *See*—
Igata, Akitosi; and Mikoda, Tamio, 4,898,850, Cl. 503-227.000.
Morii, Mitsuyoshi; Ohoka, Masaharu; Suzuki, Toshihiko; Suzuki, Katsuyuki; Kawashima, Nobuhiro; Morii, Noriko; and Mori, Kunizo, 4,898,825, Cl. 435-212.000.

Miura, Kunihiko: *See*—
Tanimoto, Koji; Miura, Kunihiko; and Koseki, Junichi, 4,899,226, Cl. 358-451.000.

Miwa, Tamotsu: *See*—
Isoda, Sumiro; Aibara, Shunzo; Miwa, Tamotsu; Fujiwara, Hiroyuki; Yokohama, Shuichi; and Matsumoto, Hiroo, 4,898,943, Cl. 544-251.000.

Miyagi, Masahiro: *See*—
Ochiai, Izumi; Miyagi, Masahiro; Nozawa, Yoshio; and Kitayama, Yukio, deceased, 4,898,232, Cl. 165-151.000.

Miyaishi, Yoshinori: *See*—
Sakakibara, Shiro; Kano, Yoshiaki; and Miyaishi, Yoshinori, 4,898,568, Cl. 474-245.000.

Miyajima, Toshikazu: *See*—
Tasaki, Yoji; Kurokawa, Koichi; Hattori, Katsuhide; Takano, Mikio; Miyajima, Toshikazu; Sato, Toshifumi; and Ogasawara, Katsura, 4,898,095, Cl. 102-201.000.

Miyakawa, Hideaki; and Kameyama, Makoto, to Canon Kabushiki Kaisha. Method of manufacturing a magnetic head having a thin film in a portion of its core. 4,899,241, Cl. 360-125.000.

Miyake, Izumi: *See*—
Kaneko, Kiyotaka; Miyake, Izumi; Oda, Kazuya; Nakane, Yoshio; and Shimaya, Hiroshi, 4,899,212, Cl. 358-29.000.

Miyama, Takao: *See*—
Fukui, Isao; Hayahsi, Shuzo; and Miyama, Takao, 4,898,466, Cl. 356-313.000.

Miyamoto, Kazuhisa; Miyaoka, Shuuichi; and Odaka, Masanori, to Hitachi, Ltd. Semiconductor memory. 4,899,314, Cl. 365-226.000.

Miyamoto, Shunsuke: *See*—
Omoda, Koichiro; Miyamoto, Shunsuke; Nakagawa, Takayuki; Taksmine, Yoshio; Nagashima, Shigeo; Miyoshi, Masayuki; Kazama, Yoshiharu; and Kinoshita, Yoshiaki, 4,899,273, Cl. 364-200.000.

Miyao, Kohei: *See*—
Nagahama, Fumio; Kakimoto, Norihiro; and Miyao, Kohei, 4,898,882, Cl. 514-492.000.

Miyaoka, Kazuyoshi: *See*—
Kobayashi, Kazuhiro; Koboshi, Shigeharu; and Miyaoka, Kazuyoshi, 4,898,807, Cl. 430-378.000.

Miyaoka, Shuuichi: *See*—
Miyamoto, Kazuhisa; Miyaoka, Shuuichi; and Odaka, Masanori, 4,899,314, Cl. 365-226.000.

Miyashita, Shunitsu; and Mogami, Kenji, to Kanegafuchi Kagaku Kogyo Kabushiki. Resin composition. 4,898,911, Cl. 525-74.000.

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Kumanoya, Masaki; Miyatake, Hideshi; Dosaka, Katsumi; and Konishi, Yasuhiro, 4,899,313, Cl. 365-201.000.

Miyazaki, Takeshi: *See*—
Tamba, Shinichi; Miyazaki, Takeshi; and Miguchi, Akio, 4,898,040, Cl. 74-15.630.

Miyazaki, Yasunobu; Saito, Tohru; and Nakamura, Taizo, to Nippon Steel Corporation. High-power-density beam welding method in combination with upset welding and apparatus therefor. 4,899,030, Cl. 219-121.630.

Miyazaki, Yoshiro, to Kabushiki Kaisha Toshiba. Heat-pipe system and method of and apparatus for controlling a flow rate of a working fluid in a liquid pipe of the heat pipe system. 4,898,231, Cl. 165-13.000.

Miyoshi, Masayuki: *See*—
Omoda, Koichiro; Miyamoto, Shunsuke; Nakagawa, Takayuki; Takamine, Yoshio; Nagashima, Shigeo; Miyoshi, Masayuki; Kazama, Yoshiharu; and Kinoshita, Yoshiaki, 4,899,273, Cl. 364-200.000.

Mizoguchi, Yoshiyuki: *See*—
Ogura, Tokihiko; Mizoguchi, Yoshiyuki; Ikeda, Keiichi; and Taguchi, Tomishige, 4,899,171, Cl. 346-76.0PH.

Mizrahi, Sadi: *See*—
Chu, Pochen; and Mizrahi, Sadi, 4,898,662, Cl. 208-120.000.

Mizushima, Katsuhiko: *See*—
Nakayama, Okihiko; Itoh, Toshiyuki; and Mizushima, Katsuhiko, 4,899,285, Cl. 364-453.000.

Mlodzikowski, Allan G.; Tsui, Yih-Pyng; and Ku, Hai-Pin, to Koss Corporation. Infrared stereo speaker system. 4,899,388, Cl. 381-77.000.

Mobay Corporation: *See*—
Slack, William E., 4,898,971, Cl. 560-359.000.

Mobil Oil Corp.: *See*—
Chu, Pochen; and Mizrahi, Sadi, 4,898,662, Cl. 208-120.000.
Chu, Pochen; Dwyer, Francis G.; and Schwartz, Albert B., 4,899,007, Cl. 585-467.000.
Chu, Yung P.; Kresge, Charles T.; and LaPierre, Rene B., 4,899,011, Cl. 585-481.000.
Derouane, Eric G.; and von Ballmoos, Roland, 4,898,722, Cl. 423-328.000.

Harandi, Mohsen N.; and Owen, Hartley, 4,899,002, Cl. 585-312.000.
Harandi, Mohsen N.; and Owen, Hartley, 4,899,015, Cl. 585-533.000.
Hon, Clarence C., 4,898,513, Cl. 415-121.200.
Hsia, Chung H.; Owen, Hartley; and Wright, Bernard S., 4,898,716, Cl. 422-190.000.
Hsia, Chung H.; Owen, Hartley; and Wright, Bernard S., 4,898,717, Cl. 422-190.000.
Jennings, Alfred R., Jr.; and Shu, Paul, 4,898,242, Cl. 166-285.000.
LaPierre, Rene B.; and Morrison, Roger A., 4,899,008, Cl. 585-467.000.
Medlin, W. L., 4,899,319, Cl. 367-35.000.
Min, Taeik; and Touhsaent, Robert E., 4,898,782, Cl. 428-407.000.
Min, Taeik; and Touhsaent, Robert E., 4,898,787, Cl. 428-480.000.
Solanki, J. J., 4,899,321, Cl. 367-48.000.
Yan, Tsoung Y., 4,899,017, Cl. 585-828.000.

Mobilio, Dominick: *See*—
Hughes, Philip F.; Mobilio, Dominick; and Humber, Leslie G., 4,898,967, Cl. 560-051.000.

Mochizuki, Kiyofumi; Edagawa, Noboru; and Iwamoto, Yoshinao, to Kokusai Denshin Denwa Kabushiki Kaisha. Fault monitoring system for optical fiber communication systems. 4,899,043, Cl. 250-227.000.

Moe, Rolf; Correia, David J.; and Downs, Michael, to Bjorne Enterprises, Inc. Wafer retention device. 4,898,639, Cl. 156-345.000.

Moeller, Jon D.; and Old, Donald J., to ASC Incorporated. In-roof flanging fixture and process. 4,898,016, Cl. 72-342.000.

Mogami, Kenji: *See*—
Miyashita, Shunitsu; and Mogami, Kenji, 4,898,911, Cl. 525-74.000.

Mogami, Sadatoshi: *See*—
Sekiyama, Shigeo; Nihongi, Shigeru; and Mogami, Sadatoshi, 4,897,998, Cl. 60-614.000.

Mohrmann, Karl H.; Reiser, Wolf; Linke, Siegfried W.; and Zerbes, Rudolf, to Bayer Aktiengesellschaft. Process for the preparation of oxiranes. 4,898,954, Cl. 549-519.000.

Mohrmann, Karl-Heinrich: *See*—
Gallenkamp, Bernd; Gunther, Andreas; Mohrmann, Karl-Heinrich; and Schmidt, Thomas, 4,898,979, Cl. 564-418.000.

Mohsen, Amr M.: *See*—
Hamdy, Esmat Z.; Mohsen, Amr M.; and McCullum, John L., 4,899,205, Cl. 357-51.000.

Molex Incorporated: *See*—
Case, Arnold A.; and DeRoss, Robert, 4,898,548, Cl. 439-686.000.

Molins, Desmond W.: *See*—
Hinchcliffe, Dennis; Labbe, Francis A. M.; Molins, Desmond W.; and Wiese, Paul R., 4,898,187, Cl. 131-284.000.

Molins PLC: *See*—
Hinchcliffe, Dennis; Labbe, Francis A. M.; Molins, Desmond W.; and Wiese, Paul R., 4,898,187, Cl. 131-284.000.

Molyneux, Ian: *See*—
Laflin, Philip; and Molyneux, Ian, 4,898,769, Cl. 428-283.000.

Monsanto Company: *See*—
Fields, Donald L., Jr.; Grabiak, Raymond C.; and Riley, Dennis P., 4,898,972, Cl. 562-17.000.

Montagna, John A.; Irving, Gary; Farrell, Lee; Cross, Gerald; and Miller, Stephen A., to Image Storage/Retrieval Systems, Inc. System for storing and retrieving text and associated graphics. 4,899,292, Cl. 364-521.000.

Montclair State College: *See*—
Humphrey, Brian D.; Kasner, Marc L.; and Isidor, John L., 4,898,921, Cl. 527-300.000.

Montgomery Elevator Company: *See*—
Manske, Bradley W.; and Weber, John M., 4,898,263, Cl. 187-133.000.

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Leone, David A.; Moody, G. Lawrence; Holland, William D.; Bell, Mark E.; and Robbins, W. Dale, 4,899,022, Cl. 200-50.00A.

Moore, Danny R.; Owens, James W.; and Schoggen, Howard L., to Procter & Gamble Cellulose Company, The. Twisted, chemically stiffened cellulosic fibers and absorbent structures made therefrom. 4,898,642, Cl. 162-157.600.

Morales, Lou, to Standard Microsystems Corporation. Active delay line circuit. 4,899,071, Cl. 307-605.000.

Morel, Simone, to Societe de Conseils et D'Etudes Des Emballages S.C.E.E. Closing device for containers. 4,898,293, Cl. 215-250.000.

Morgan Construction Company: *See*—
Simmons, Thomas E., 4,898,479, Cl. 384-130.000.

Morgan, James I.; Spector, Sydney; and Wang, James K. T., to Hoffmann-La Roche Inc. Method for inhibiting the proliferation of tumor cells. 4,898,861, Cl. 514-221.000.

Mori, Hiroshi: *See*—
Yamamoto, Naoki; Mori, Hiroshi; Nakata, Akira; and Suehiro, Misayo, 4,898,918, Cl. 525-425.000.

Mori, Kei. Light radiation device for use in medical treatment. 4,898,438, Cl. 350-96.100.

Mori, Kei. Light radiation device for use in medical treatment. 4,898,439, Cl. 350-96.100.

Mori, Kunizo: *See*—
Morii, Mitsuyoshi; Ohoka, Masaharu; Suzuki, Toshihiko; Suzuki, Katsuyuki; Kawashima, Nobuhiro; Morii, Noriko; and Mori, Kunizo, 4,898,825, Cl. 435-212.000.

Mori, Masaharu: *See*—
Akazawa, Shigeo; Mori, Masaharu; and Hamatsu, Masahiro, 4,899,364, Cl. 375-1.000.

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Yumoto, Hideaki; Yonemura, Masao; Nagase, Mamoru; Yamada, Yoshito; Fujiwara, Yoshiyasu; Okamoto, Masakatsu; and Hosokawa, Yasutoshi, 4,898,022, Cl. 73-46.000.
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Aoai, Toshiaki; Aoshima, Keitaro; and Nagashima, Akira, 4,898,803, Cl. 430-191.000.
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Omoda, Koichiro; Miyamoto, Shunsuke; Nakagawa, Takayuki; Takamine, Yoshio; Nagashima, Shigeo; Miyoshi, Masayuki; Kazama, Yoshiharu; and Kinoshita, Yoshiaki, 4,899,273, Cl. 364-200.000.
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Aikawa, Masatoshi; Nakagawa, Hiromasa; and Umeki, Tsunenori, 4,899,066, Cl. 307-45.200.
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Kenmochi, Toshihisa; and Nakamura, Tatsunori, 4,898,419, Cl. 296-204.000.
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Ikada, Yoshito; Suong, Hyu H.; Shimizu, Yoshihiko; Watanabe, Satoshi; Nakamura, Tatsuo; Suzuki, Masakazu; and Shimamoto, Takeshi, 4,898,186, Cl. 606-62.000.
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Asada, Masanori; Hamaguchi, Shigeki; Katsuki, Hidetoshi; Nakamura, Yoshio; Takahashi, Hideyuki; Takahara, Kenji; Shimada, Yoshio; Ohashi, Takehisa; and Watanabe, Kiyoshi, 4,898,822, Cl. 435-121.000.
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Kaneko, Kiyotaka; Miyake, Izumi; Oda, Kazuya; Nakane, Yoshio; and Shimaya, Hiroshi, 4,899,212, Cl. 358-29.000.
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Kiyohara, Kazuto; Yamazaki, Toshiaki; Harada, Ichiya; Nakadate, Takanori; Noguchi, Kentaro; Nakano, Michiteru; Sakae, Shigeru; and Okuma, Kazuhiro, 4,898,897, Cl. 523-343.000.
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Yamamoto, Naoki; Mori, Hiroshi; Nakata, Akira; and Suehiro, Misayo, 4,898,918, Cl. 525-425.000.
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Horaguchi, Yoichi; Tomizawa, Takashi; Hayashi, Shigeyuki; Ohno, Motoshi; and Nakata, Takashi, 4,899,193, Cl. 355-55.000.

Nakayama, Masaaki: *See*—
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Gross, Anthony E., 4,898,611, Cl. 75-3.000.
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Kazuo, Ogawa; Ichiro, Yamawaki; Yoichi, Matsushita; Naruo, Nomura; and Issei, Okazaki, 4,898,867, Cl. 514-258.000.

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Cottenden, Alan M., 4,898,594, Cl. 604-397.000.

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Needles, William M., 4,899,305, Cl. 364-787.000.

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Brull, Robert A.; Del Signore, James R., II; and Walker, Alan H., 4,898,487, Cl. 400-354.000.
Coffey, James B.; and Gwynn, Leslie B., 4,898,322, Cl. 229-69.000.

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Gage, Douglas M.; and Neagle, Stuart L., 4,898,078, Cl. 91-524.000.

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Endo, Hiroshi; Suzuki, Takao; Komoto, Mitsuo; Uekido, Kouzou; and Tokaichi, Tetsuro, 4,898,545, Cl. 439-578.000.
Ichikawa, Masako; and Mitome, Yukio, 4,899,386, Cl. 381-43.000.
Kage, Kouzou, 4,899,350, Cl. 375-52.000.
Kimura, Masayuki, 4,899,303, Cl. 364-739.000.
Kuwahara, Yoshihiko, 4,899,160, Cl. 342-408.000.
Nagami, Akira, 4,899,316, Cl. 365-189.010.
Nakayama, Misayo, 4,899,302, Cl. 364-729.000.
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Numai, Takahiro, 4,899,361, Cl. 372-50.000.
Shimada, Keiko, 4,899,380, Cl. 379-389.000.
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Tomimitsu, Yasuharu, 4,899,341, Cl. 371-37.600.

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Nelson, George C., to Cyclonaire Corporation. Injector valve. 4,898,208, Cl. 137-614.200.

Nelson, Robert J.: *See*—
Karger, Barry L.; Paulus, Aran; Cohen, Aharon S.; and Nelson, Robert J., 4,898,658, Cl. 204-299.00R.

Ness, Ronald J.: *See*—
Weigand, Francis K.; Ness, Ronald J.; and Koerner, Michael S., 4,898,000, Cl. 60-740.000.

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Dietsch, Hans E.; and Nestork, William J., 4,899,208, Cl. 357-74.000.

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Musacchio, Jose M.; and Tortella, Frank C., 4,898,860, Cl. 514-215.000.

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Ng, Steve Y.: *See*—
Heller, Jorge; Penhale, Donald W. H.; and Ng, Steve Y., 4,898,928, Cl. 528-392.000.

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Yajima, Yasuhito; and Watanabe, Yasushi, 4,898,035, Cl. 73-727.000.

Nguyen, Luu Thanh: *See*—
Ledermann, Peter G.; and Nguyen, Luu Thanh, 4,898,117, Cl. 118-665.000.

Nicholas, Glenn V.: *See*—
Norman, Daniel A.; Newton, Ronald R.; Nicholas, Glenn V.; Bellofatto, Steven; and Onody, Stephen K., 4,898,169, Cl. 606-42.000.

Nicholson, James E.: *See*—
Gatturna, Roland F.; Nicholson, James E.; and O'Leary, James, 4,898,156, Cl. 606-72.000.

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Nieda, Yasuhiro: *See*—
Kimura, Mitsutoshi; and Nieda, Yasuhiro, 4,899,085, Cl. 315-116.000.

Nieter, Jeffrey J.; and DeBlois, Raymond L., to United Technologies Corporation. Method of and arrangement for reducing bearing loads in scroll compressors. 4,898,520, Cl. 418-1.000.

Nihon Kohden Corporation: *See*—
Hosoya, Tsuguharu, 4,899,177, Cl. 346-139.00R.

Nihongi, Shigeru: *See*—
Sekiyama, Shigeo; Nihongi, Shigeru; and Mogami, Sadatoshi, 4,897,998, Cl. 60-614.000.

Nii, Takayuki: *See*—
Saeki, Takashi; Nii, Takayuki; Fukui, Hirotake; Mishina, Toshiro; Nakano, Haruo; and Sakakibara, Hitoshi, 4,899,158, Cl. 342-44.000.

Niikura, Yasuhiro, to Nissan Motor Co., Ltd. Electro-hydraulic control for reducing engagement shock in an automatic transmission. 4,898,049, Cl. 74-866.000.

Nikko Co., Ltd.: *See*—
Ishimoto, Zenichi, 4,898,562, Cl. 446-460.000.

Ninomiya, Hiroshi: *See*—
Nakama, Katsuhiko; Ninomiya, Hiroshi; Michishige, Toru; and Itsuki, Fumiaki, 4,898,549, Cl. 439-701.000.

Nippon Cable System Inc.: *See*—
Baba, Masanao, 4,898,045, Cl. 74-471.00R.

Nippon Hypox Laboratories Incorporated: *See*—
Sato, Toshio; Matsumoto, Hitoshi; and Kakegawa, Hisao, 4,898,890, Cl. 514-685.000.

Nippon Iron Powder Co., Ltd.: *See*—
Tachibana, Hidekiyo; Noda, Akihiko; Terao, Kazuo; Honjou, Toshio; Seki, Yukio; Endo, Hiroshi; and Yokobari, Toshio, 4,898,801, Cl. 430-106.600.

Nippon Kayaku Kabushiki Kaisha: *See*—
Ishikura, Tsukasa; and Fukushima, Tatuharu, 4,898,996, Cl. 568-938.000.

Nippon Oil Co., Ltd.: *See*—
Ushio, Masaru; and Okazaki, Hajime, 4,898,661, Cl. 208-117.000.

Nippon Oil and Fats Co., Ltd.: *See*—
Masuoka, Shigeru; Doi, Hiroshi; and Honda, Yoshihiro, 4,898,895, Cl. 523-122.000.

Nippon Oil and Fats Company, Limited and Kajima Corporation: *See*—
Tasaki, Yoji; Kurokawa, Koichi; Hattori, Katsuhide; Takano, Mikio; Miyajima, Toshikazu; Sato, Toshifumi; and Ogasawara, Katsura, 4,898,095, Cl. 102-201.000.

Nippon Petrochemicals Co. Ltd.: *See*—
Kawakami, Shigenobu; Endo, Keiji; Dohi, Hideyuki; and Sato, Atsushi, 4,899,009, Cl. 585-471.000.

Nippon Seiko Kabushiki Kaisha: *See*—
Igarashi, Tomoharu; Yokote, Yoshiniro; and Yamamoto, Kazuo, 4,898,402, Cl. 280-804.000.
Osawa, Nobuyuki, 4,898,478, Cl. 384-45.000.

Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See*—
Minami, Kenji; Yatagai, Hidetaka; and Sano, Yoshinori, 4,898,788, Cl. 428-481.000.

Nippon Soken, Inc.: *See*—
Numata, Koji; Asakura, Fumio; Kago, Yoshiyuki; Nozawa, Masaei; Shibakawa, Takahiro; Akado, Hajime; and Kato, Hideharu, 4,898,462, Cl. 356-70.000.

Nippon Steel Corporation: *See*—
Miyazaki, Yasunobu; Saito, Tohru; and Nakamura, Taizo, 4,899,030, Cl. 219-121.630.
Oka, Joji; and Nishioka, Ryoji, 4,898,775, Cl. 428-336.000.

Nippon Telegraph and Telephone: *See*—
Osaka, Takaaki; Matsui, Norio; Susaki, Shinichi; and Egawa, Yutaka, 4,897,918, Cl. 29-830.000.

Nippon Telegraph and Telephone Corporation: *See*—
Ohta, Masataka, 4,899,072, Cl. 310-49.00R.
Ooba, Yuji; Sugihara, Shigeo; Masumori, Tadaaki; and Shiwa, Shinichi, 4,899,224, Cl. 358-332.000.
Tamamura, Toshiaki; Katsuta; Niwa, Osamu; Hikita, Makoto; and Sugita, Akio, 4,898,766, Cl. 428-195.000.

Nippondenso Co., Ltd.: *See*—
Numata, Koji; Asakura, Fumio; Kago, Yoshiyuki; Nozawa, Masaei; Shibakawa, Takahiro; Akado, Hajime; and Kato, Hideharu, 4,898,462, Cl. 356-70.000.
Shibata, Hiroshi; Maehara, Fuyuki; Shintai, Akira; and Kato, Hidetoshi, 4,899,209, Cl. 357-74.000.
Shiga, Syoji; Matsuda, Akira; Shibata, Nobuyuki; and Akasaka, Kiichi, 4,898,318, Cl. 228-183.000.
Takeuchi, Muneo; Kinbara, Hiroji; and Tsuruta, Masafumi, 4,899,073, Cl. 310-116.000.

Nishihata, Ken: *See*—
Shibahara, Seiji; Okonogi, Tsuneo; Murai, Yasushi; Kudo, Toshiaki; Yoshida, Takashi; Nishihata, Ken; and Kondo, Shinichi, 4,898,858, Cl. 514-206.000.

Nishikiori, Hiroshi: *See*—
Ohe, Takeshi; Taniguchi, Yoshiaki; and Nishikiori, Hiroshi, 4,898,258, Cl. 180-79.100.

Nishimori, Kadotaro: *See*—
Ito, Masazumi; Nishimori, Kadotaro; and Oyabu, Masaaki, 4,899,140, Cl. 340-756.000.

Nishimura, Eiji; Nobumoto, Kazutoshi; Matsuoka, Toshihiro; Tsuyama, Toshiaki; and Sotoyama, Kaoru, to Mazda Motor Corporation. Engine control apparatus. 4,898,138, Cl. 123-399.000.

Nishimura, Makoto; Nonaka, Takashi; Uenishi, Isao; and Goto, Tamotsu. Highly shrinkable substantially acrylic filament yarn. 4,897,990, Cl. 57-247.000.

Nishimura, Shigeru: *See*—
Ueki, Noriyuki; and Nishimura, Shigeru, 4,898,207, Cl. 137-539.000.

Nishioka, Ryoji: *See*—
Oka, Joji; and Nishioka, Ryoji, 4,898,775, Cl. 428-336.000.

Nishitani, Takao; Kawakami, Yuichi; Tanaka, Hideo; and Kuroda, Ichiro, to NEC Corporation. Signal processor for rapidly calculating a predetermined calculation a plurality of times to typically carrying out FFT or inverse FFT. 4,899,301, Cl. 364-726.000.

Nishizeki, Masato: *See*—
Tachibana, Noriki; Nishizeki, Masato; and Kagawa, Nobuaki, 4,898,808, Cl. 430-510.000.

Nissan Motor Company, Limited: *See*—
Futami, Tohru; and Takeuchi, Mikio, 4,898,010, Cl. 70-278.000.
Kitayama, Tooru; and Ohtani, Toshiya, 4,898,139, Cl. 123-425.000.
Nakayama, Okihiko; Itoh, Toshiyuki; and Mizushima, Katsuhiko, 4,899,285, Cl. 364-453.000.
Niikura, Yasuhiro, 4,898,049, Cl. 74-866.000.
Takeuchi, Kiyoshi, 4,898,024, Cl. 73-115.000.

Nisson Motor Co., Ltd.: *See*—
Kataoka, Sachiro; Yamamoto, Yukio; and Okai, Saburo, 4,899,083, Cl. 315-77.000.

Nitta, Jiro, to Kabushiki Kaisha Neriki. Gas-cylinder valve. 4,898,210, Cl. 137-614.190.

Nitto Kohki Co., Ltd.: *See*—
Saito, Masayuki; and Kazama, Yasuo, 4,898,370, Cl. 269-91.000.

Niven, Benjamin F., Jr.; and Mays, Charles D., to R. J. Reynolds Tobacco Company. Tobacco Processing. 4,898,188, Cl. 131-296.000.

Niwa, Osamu: *See*—
Tamamura, Toshiaki; Katsuta; Niwa, Osamu; Hikita, Makoto; and Sugita, Akio, 4,898,766, Cl. 428-195.000.

NKK Corporation: *See*—
Iwasa, Hiroki; Watanabe, Toyofumi; and Furuya, Hirohide, 4,898,649, Cl. 204-28.000.
Teshima, Toshio; Kitagawa, Tooru; Suzuki, Mikio; Masaoka, Toshi; Mori, Takashi; and Okimoto, Kazutaka, 4,898,226, Cl. 168-415.000.

Noble, David: *See*—
Ward, John B.; Noble, Hazel M.; Porter, Neil; Fletton, Richard A.; and Noble, David, 4,898,821, Cl. 435-119.000.

Noble, Hazel M.: *See*—
Ward, John B.; Noble, Hazel M.; Porter, Neil; Fletton, Richard A.; and Noble, David, 4,898,821, Cl. 435-119.000.

Nobumoto, Kazutoshi: *See*—
Nishimura, Eiji; Nobumoto, Kazutoshi; Matsuoka, Toshihiro; Tsuyama, Toshiaki; and Sotoyama, Kaoru, 4,898,138, Cl. 123-399.000.

Noda, Akihiko: *See*—
Tachibana, Hidekiyo; Noda, Akihiko; Terao, Kazuo; Honjou, Toshio; Seki, Yukio; Endo, Hiroshi; and Yokobari, Toshio, 4,898,801, Cl. 430-106.600.

Noehren, William L.: *See*—
Beno, Edward A.; and Noehren, William L., 4,898,515, Cl. 416-134.00A.

Noguchi, Kentaro: *See*—
Kiyohara, Kazuto; Yamazaki, Toshiaki; Harada, Ichiya; Nakadate, Takanori; Noguchi, Kentaro; Nakano, Michiteru; Sakae, Shigeru; and Okuma, Kazuhiro, 4,898,897, Cl. 523-343.000.

Noguchi, Toshiaki, to Olympus Optical Co., Ltd. Out-body observing apparatus. 4,898,175, Cl. 128-634.000.

NOK Corporation: *See*—
Kawase, Ritsuo, 4,898,395, Cl. 277-207.00A.

Nomura, Etsuzo; Takeuchi, Hirokazu; Suzuki, Shigeru; Irie, Kazunori; and Itoh, Hirosumi, to Kogyo Kabushiki Kaisha. Pattern-matching sewing machine. 4,898,110, Cl. 112-314.000.

Nomura, Kenichiro: *See*—
Motomura, Masatoshi; Muramatsu, Ichiro; Okoshi, Noboru; Araki, Yoshitami; Nomura, Kenichiro; Kozai, Takehisa; and Mita, Hiroshi, 4,898,617, Cl. 106-281.100.

Nonaka, Takashi: *See*—
Nishimura, Makoto; Nonaka, Takashi; Uenishi, Isao; and Goto, Tamotsu, 4,897,990, Cl. 57-247.000.

Nonweiler, Brian R. G., to Quantel Limited. Video signal processing. 4,899,295, Cl. 364-522.000.

Nordica S.p.A.: *See*—
Sartor, Mariano, 4,897,940, Cl. 36-119.000.

Nordson Corporation: *See*—
Byerly, David J.; Frates, Paul S.; and Scholl, Charles H., 4,898,302, Cl. 222-49.000.

Norman, Daniel A.; Newton, Ronald R.; Nicholas, Glenn V.; Bellofatto, Steven; and Onody, Stephen K., to Boston Scientific Corporation. Medical instrument for therapy of hemorrhoidal lesions. 4,898,169, Cl. 606-42.000.

Norris, Alan H. Living space ventilation. 4,898,086, Cl. 98-33.100.

Norris, Annie B. Flying insect container guard. 4,898,298, Cl. 220-90.200.

Norris, Jerome J.: *See*—
Jones, Frank A., Jr., 4,898,542, Cl. 439-371.000.

North American Philips Consumer Electronics Corp.: *See*—
Day, James C., 4,898,556, Cl. 445-36.000.
Miller, William G., 4,899,221, Cl. 358-167.000.

North American Philips Corporation: *See*—
Basile, Carlo; Cavallerano, Alan P.; and Tsinberg, Mikhail, 4,899,220, Cl. 358-141.000.

Northeastern University: *See*—
Karger, Barry L.; Paulus, Aran; Cohen, Aharon S.; and Nelson, Robert J., 4,898,658, Cl. 204-299.00R.

Northern Telecom Limited: *See*—
Ho, Vu Q., 4,898,841, Cl. 437-200.000.

Northrop Corporation: *See*—
Perkins, Harley A., 4,899,346, Cl. 372-32.000.

Norton Company: *See*—
Hay, John; Markhoff-Matheny, Carole J.; and Swanson, Brian E., 4,898,597, Cl. 51-298.000.

Nottingham, John R.; and Spirk, John. Self-inflating toy. 4,898,561, Cl. 446-220.000.

Nottingham, William D.: *See*—
Jones, Glenn C.; and Nottingham, William D., 4,898,969, Cl. 560-187.000.

Novasina AG: *See*—
Horn, Petr, 4,898,475, Cl. 374-28.000.

Nozawa, Masaei: *See*—
Numata, Koji; Asakura, Fumio; Kago, Yoshiyuki; Nozawa, Masaei; Shibakawa, Takahiro; Akado, Hajime; and Kato, Hideharu, 4,898,462, Cl. 356-70.000.

Nozawa, Yoshio: *See*—
Ochiai, Izumi; Miyagi, Masahiro; Nozawa, Yoshio; and Kitayama, Yukio, deceased, 4,898,232, Cl. 165-151.000.

Nozeran, Jean-Marc: *See*—
Grimaud, Jean-Michel; and Nozeran, Jean-Marc, 4,899,281, Cl. 364-431.040.

Nugent, Walter J., to Walter Locks Pty Ltd. Lock. 4,898,011, Cl. 70-379.00R.

Numai, Takahiro, to NEC Corporation. Optical filter device. 4,899,361, Cl. 372-50.000.

Numata, Ken-ichi: *See*—
Konishi, Masataka; Tomita, Koji; Oka, Masahisa; and Numata, Ken-ichi, 4,898,940, Cl. 540-460.000.

Numata, Koji; Asakura, Fumio; Kago, Yoshiyuki; Nozawa, Masaei; Shibakawa, Takahiro; Akado, Hajime; and Kato, Hideharu, to Nippondenso Co., Ltd.; and Nippon Soken, Inc. Device for detecting a transmissivity of a substance. 4,898,462, Cl. 356-70.000.

Numbers, Jody L.: *See*—
Lakoski, Robert P.; and Numbers, Jody L., 4,898,009, Cl. 70-58.000.

Nyman, William F.: *See*—
Plut, Leonard F.; and Nyman, William F., 4,899,357, Cl. 378-148.000.
NYNEX: *See*—
Kondziela, James M., 4,899,369, Cl. 379-101.000.
Nyquist, Jeffery A.: *See*—
Willard, Mark L.; Beatty, David E.; and Nyquist, Jeffery A., 4,898,528, Cl. 425-185.000.
Oates, Robert M.: *See*—
Hansen, J. Richard; Asars, Juris A.; and Oates, Robert M., 4,899,044, Cl. 250-227.000.
Obata, Shuichi: *See*—
Takewa, Hiroyuki; Serikawa, Mitsuhiko; Ishikawa, Seiichi; Usuki, Sawako; Kimura, Yoichi; and Obata, Shuichi, 4,899,390, Cl. 381-154.000.
Ocello, Dennis M.; and Taylor, Harry L., to Ocello Tool & Die Co. Portable door lock. 4,898,411, Cl. 292-292.000.
Ocello Tool & Die Co.: *See*—
Ocello, Dennis M.; and Taylor, Harry L., 4,898,411, Cl. 292-292.000.
Ochiai, Izumi; Miyagi, Masahiro; Nozawa, Yoshio; and Kitayama, Yukio, deceased (by Kitayama, Yuko, Midori Kitayama, Takahisha Kitayama, successors), to Hitachi, Ltd. Heat exchanger and process for producing the same. 4,898,232, Cl. 165-151.000.
O'Connor, Lawrence J., to KT Technologies Inc. Cable shielding tape and cables incorporating such tape. 4,898,640, Cl. 156-204.000.
Oda, Kazuya: *See*—
Kaneko, Kiyotaka; Miyake, Izumi; Oda, Kazuya; Nakane, Yoshio; and Shimaya, Hiroshi, 4,899,212, Cl. 358-29.000.
Oda, Yukio: *See*—
Maruyama, Toshio; Oda, Yukio; and Yamaguchi, Syoji, 4,897,967, Cl. 51-165.870.
Odajima, Katsuhiko; and Ikehata, Motoshige, to Shoketsu Kinzohu Kogyo Kabushiki Kaisha. Electropneumatic transducer. 4,898,200, Cl. 137-85.000.
Odaka, Kentaro; Ozaki, Shinya; Yamada, Masaki; Ishibashi, Hiroshi; and Inazawa, Yoshizumi, to Sony Corporation. Apparatus for recording and/or reproducing digital data information. 4,899,232, Cl. 360-48.000.
Odaka, Masanori: *See*—
Miyamoto, Kazuhisa; Miyaoka, Shuuichi; and Odaka, Masanori, 4,899,314, Cl. 365-226.000.
Odawara, Kazuharu: *See*—
Ishii, Masaru; and Odawara, Kazuharu, 4,899,328, Cl. 369-77.200.
Odenthal, Conrad J., to Tektronix, Inc. Cathode-ray-tube astigmatism correction apparatus. 4,899,091, Cl. 315-382.000.
ODL, Incorporated: *See*—
Artwick, Kert E.; Wilkening, Steven R.; and Pallin, Leslie L., 4,897,975, Cl. 52-208.000.
Oefner, Walter, to Messerschmitt-Bolkow-Blohm GmbH. Insert for a sandwich structure. 4,898,756, Cl. 428-34.100.
Office National d'Etudes et de Recherche Aerospatiales: *See*—
Appel, Jean, 4,899,289, Cl. 364-484.000.
Ogasawara, Katsura: *See*—
Tasaki, Yoji; Kurokawa, Koichi; Hattori, Katsuhide; Takano, Mikio; Miyajima, Toshikazu; Sato, Toshifumi; and Ogasawara, Katsura, 4,898,095, Cl. 102-201.000.
Ogata, Seishiro; and Taki, Katsumi, to Sumitomo Heavy Industries, Ltd. Planetary reduction gear. 4,898,065, Cl. 475-179.000.
Ogawa, Hiroaki: *See*—
Baba, Fumio; Kobayashi, Kazuya; Enomoto, Seiji; and Ogawa, Hiroaki, 4,899,310, Cl. 365-189.050.
Ogawa, Hiroyasu: *See*—
Suto, Yoshinori; Ito, Toshiyuki; Nakajima, Hideyuki; Okamura, Keiichiro; Nayuki, Shin-ichi; Ogawa, Hiroyasu; and Enomoto, Harumitsu, 4,898,723, Cl. 423-447.400.
Ogden, Frank J.: *See*—
Clark, Maxwell J.; McMillan, Roy; and Ogden, Frank J., 4,898,251, Cl. 175-27.000.
Ogihara, Masahiro; Makikawa, Shinji; and Iguchi, Masaaki, to Shin-Etsu Chemical Co., Ltd. Single crystal wafer of lithium tantalate. 4,898,641, Cl. 156-601.000.
Ogino, Akihiko: *See*—
Fukahori, Yoshihide; Kojima, Hiromu; Ogino, Akihiko; Suzuki, Shigenobu; and Yoshizawa, Toshikazu, 4,899,323, Cl. 367-176.000.
Oglevee, J. Robert; and Craig, Richard, to Oglevee, Ltd.; and Research Corporation Technologies, Inc., a part interest. Precision flowering of regal pelargoniums (*pelargonium xdomesticum*). 4,897,957, Cl. 47-58.000.
Oglevee, Ltd.: *See*—
Oglevee, J. Robert; and Craig, Richard, 4,897,957, Cl. 47-58.000.
Oguchi, Yoshihiro: *See*—
Sugata, Masao; Den, Tohru; Ito, Susumu; Hirabayashi, Keiji; Ikoma, Keiko; Kurihara, Noriko; Osabe, Kuniji; Takeuchi, Tatsuo; Satomura, Hiroshi; Oguchi, Yoshihiro; Maruyama, Akio; and Saito, Keishi, 4,898,798, Cl. 430-58.000.
Ogura, Eiji; Mito, Kunihiro; and Arai, Shoji, to Onoda Cement Co., Ltd.; and Tosoh Corporation. Process for producing fluorinated esters. 4,898,970, Cl. 560-236.000.
Ogura, Mitsuhiro, to Hewlett Packard Company. Personality board. 4,899,106, Cl. 324-158.00F.
Ogura, Tokihiko; Mizoguchi, Yoshiyuki; Ikeda, Keiichi; and Taguchi, Tomishige, to Canon Kabushiki Kaisha. Thermal printer. 4,899,171, Cl. 346-76.0PH.
Oh, Ki Tae, to Goldstar Co., Ltd. Automatic cooking control system for a microwave oven. 4,899,026, Cl. 219-10.55M.
Ohashi, Masahiko: *See*—
Kitoh, Osamu; and Ohashi, Masahiko, 4,898,630, Cl. 156-79.000.
Ohashi, Takehisa: *See*—
Asada, Masanori; Hamaguchi, Shigeki; Katsuki, Hidetoshi; Nakamura, Yoshio; Takahashi, Hideyuki; Takahara, Kenji; Shimada, Yoshio; Ohashi, Takehisa; and Watanabe, Kiyoshi, 4,898,822, Cl. 435-121.000.
Ohe, Takeshi; Taniguchi, Yoshiaki; and Nishikiori, Hiroshi, to Jidosha Kiki Co., Ltd. Electric power steering apparatus. 4,898,258, Cl. 180-79.100.
Ohmori, Takashi: *See*—
Kuroda, Michio; Sato, Isao; Ishibashi, Yoji; Uchiyama, Yoshihiro; Ohmori, Takashi; Akatsu, Shigeyuki; Kato, Fumio; Segawa, Yorihide; and Iizuka, Nobuyuki, 4,898,001, Cl. 60-733.000.
Ohmori, Toshitaka, to Olympic Co., Ltd. Rotary electric tool. 4,898,249, Cl. 173-12.000.
Ohno, Motoshi: *See*—
Horaguchi, Yoichi; Tomizawa, Takashi; Hayashi, Shigeyuki; Ohno, Motoshi; and Nakata, Takashi, 4,899,193, Cl. 355-55.000.
Ohno, Satoshi; and Hiramitsu, Tetsushi, to Toyoda Gosei Co., Ltd. Printed wiring unit for horn switch. 4,899,020, Cl. 174-68.500.
Ohoka, Masaharu: *See*—
Morii, Mitsuyoshi; Ohoka, Masaharu; Suzuki, Toshihiko; Suzuki, Katsuyuki; Kawashima, Nobuhiro; Morii, Noriko; and Mori, Kunizo, 4,898,825, Cl. 435-212.000.
Ohta, Masataka, to Nippon Telegraph and Telephone Corporation. Pulse motor. 4,899,072, Cl. 310-49.00R.
Ohtake, Shigeaki; Kogawa, Kuniyuki; and Hirota, Takato, to Fuji Electric Co., Ltd. Electromagnetic contactor. 4,899,120, Cl. 335-132.000.
Ohtani, Toshiya: *See*—
Kitayama, Tooru; and Ohtani, Toshiya, 4,898,139, Cl. 123-425.000.
Ohtsuka, Isao: *See*—
Kishino, Takao; Katayama, Minoru; Yano, Kazuyuki; and Ohtsuka, Isao, 4,899,081, Cl. 313-496.000.
Ohtsuka, Tatsumi: *See*—
Oikawa, Takahiro; Suzuki, Yoshiyuki; and Ohtsuka, Tatsumi, 4,898,031, Cl. 73-505.000.
Ohya, Jun: *See*—
Fujita, Toshihiro; Ohya, Jun; Matsuda, Kenichi; and Serizawa, Hiroyuki, 4,899,360, Cl. 372-50.000.
Oikawa, Takahiro; Suzuki, Yoshiyuki; and Ohtsuka, Tatsumi, to Yazaki Corporation. Vibrational angular velocity sensor. 4,898,031, Cl. 73-505.000.
Oishi, Kengo, to Fuji Photo Film Co., Ltd. Magnetic tape cassette. 4,898,338, Cl. 242-198.000.
Oka, Joji; and Nishioka, Ryoji, to Nippon Steel Corporation. Paint coated metal sheets. 4,898,775, Cl. 428-336.000.
Oka, Masahisa: *See*—
Konishi, Masataka; Tomita, Koji; Oka, Masahisa; and Numata, Ken-ichi, 4,898,940, Cl. 540-460.000.
Okada, Kazuichi: *See*—
Arai, Akihiko; Okada, Kazuichi; Kamo, Tetsuo; and Shiota, Eiji, 4,899,028, Cl. 219-10.493.
Okada, Shinjiro; Taniguchi, Osamu; Tsuboyama, Akira; and Enari, Masahiko, to Canon Kabushiki Kaisha. Liquid crystal optical device. 4,898,456, Cl. 350-350.00S.
Okai, Saburo: *See*—
Kataoka, Sachiro; Yamamoto, Yukio; and Okai, Saburo, 4,899,083, Cl. 315-77.000.
Okamoto, Masakatsu: *See*—
Yumoto, Hideaki; Yonemura, Masao; Nagase, Mamoru; Yamada, Yoshito; Fujiwara, Yoshiyasu; Okamoto, Masakatsu; and Hosokawa, Yasutoshi, 4,898,022, Cl. 73-46.000.
Okamoto, Tsuneo; and Sakaguchi, Yasuo, to Kureha Kagaku Kogyo Kabushiki Kaisha. Fluidized-bed activation furnace for activated carbon. 4,898,533, Cl. 432-58.000.
Okamoto, Tsutomu: *See*—
Tamada, Hitoshi; Kaneko, Masahiko; and Okamoto, Tsutomu, 4,898,440, Cl. 350-96.130.
Okamoto, Yasunari: *See*—
Kozoe, Katsutoshi; Furuya, Nobuo; Kimura, Shinichi; Okamoto, Yasunari; Kumada, Mitsuyoshi; Sugimoto, Tatsuo; Ueno, Takehiko; Shimizu, Kenjiro; and Itoh, Tsutomu, 4,898,116, Cl. 118-621.000.
Okamura, Keiichiro: *See*—
Suto, Yoshinori; Ito, Toshiyuki; Nakajima, Hideyuki; Okamura, Keiichiro; Nayuki, Shin-ichi; Ogawa, Hiroyasu; and Enomoto, Harumitsu, 4,898,723, Cl. 423-447.400.
Okamura, Masatoshi: *See*—
Hashizume, Kenji; Ikebe, Masaru; Okamura, Masatoshi; and Shiba, Haruo, 4,899,242, Cl. 360-132.000.
Okawa, Masayuki: *See*—
Tsujimura, Osamu; Arai, Tatsuo; Nakayama, Masaaki; and Okawa, Masayuki, 4,898,499, Cl. 407-42.000.
Okawa, Susumu: *See*—
Tatara, Yudai; Sato, Kiyoomi; Okawa, Susumu; and Jufuku, Yasunobu, 4,898,567, Cl. 474-174.000.
Okazaki, Hajime: *See*—
Ushio, Masaru; and Okazaki, Hajime, 4,898,661, Cl. 208-117.000.
Oki Electric Co., Ltd.: *See*—
Kitazawa, Shooji; Kuwabara, Hiroshi; and Harada, Teruhiro, 4,899,309, Cl. 365-189.010.

Oki Electric Industry Co., Ltd.: *See*—
Ino, Masayoshi, 4,899,203, Cl. 357-23.600.
Sato, Takuro; Shimazaki, Yoshihito; and Kawabe, Manabu, 4,899,148, Cl. 341-65.000.
Shimizu, Shogo, 4,899,334, Cl. 370-60.000.
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Yamamoto, Takehiko; Kubota, Terumasa; Itoh, Isao; Kato, Hiroyuki; Kikuchi, Terumi; Kawasaki, Hiroko; Mashimoto, Misako; and Oki, Yuji, 4,898,738, Cl. 426-17.000.
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Okoshi, Noboru: *See*—
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Moeller, Jon D.; and Old, Donald J., 4,898,016, Cl. 72-342.000.
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Gatturna, Roland F.; Nicholson, James E.; and O'Leary, James, 4,898,156, Cl. 606-72.000.
Olesky, Edward R.: *See*—
Cochran, Ivan L., 4,898,552, Cl. 440-71.000.
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Wilk, Sven T.; and Olsson, John G., 4,899,131, Cl. 340-518.000.
Olympia Aktiengesellschaft: *See*—
Johannsen, Fred, 4,897,903, Cl. 29-25.350.
Olympic Co., Ltd.: *See*—
Ohmori, Toshitaka, 4,898,249, Cl. 173-12.000.
Olympus Optical Co., Ltd.: *See*—
Maruyama, Atsushi, 4,899,191, Cl. 354-421.000.
Noguchi, Toshiaki, 4,898,175, Cl. 128-634.000.
Uchiyama, Naoki; Shishido, Yoshio; and Ueda, Yasuhiro, 4,898,574, Cl. 604-22.000.
OMI International Corporation: *See*—
Bammel, Brian D.; Wieczerniak, Walter J.; and Snell, Kenneth D., 4,898,652, Cl. 204-44.200.
Omoda, Koichiro; Miyamoto, Shunsuke; Nakagawa, Takayuki; Takamine, Yoshio; Nagashima, Shigeo; Miyoshi, Masayuki; Kazama, Yoshiharu; and Kinoshita, Yoshiaki, to Hitachi, Ltd. Circuit simulation method with clock event suppression for debugging LSI circuits. 4,899,273, Cl. 364-200.000.
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Nakama, Katsuhiko; Ninomiya, Hiroshi; Michishige, Toru; and Itsuki, Fumiaki, 4,898,549, Cl. 439-701.000.
Yamamoto, Masato, 4,899,257, Cl. 361-395.000.
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Kanda, Nobuo; Omura, Haruo; Abe, Yukihiro; and Kondo, Mitsuru, 4,898,941, Cl. 540-596.000.
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Takada, Mitsuyuki; Takasago, Hayato; and Onishi, Yoichiro, 4,898,805, Cl. 430-315.000.
Onoda Cement Company, Ltd.: *See*—
Kozoe, Katsutoshi; Furuya, Nobuo; Kimura, Shinichi; Okamoto, Yasunari; Kumada, Mitsuyoshi; Sugimoto, Tatsuo; Ueno, Takehiko; Shimizu, Kenjiro; and Itoh, Tsutomu, 4,898,116, Cl. 118-621.000.
Ogura, Eiji; Mito, Kunihiro; and Arai, Shoji, 4,898,970, Cl. 560-236.000.
Onody, Stephen K.: *See*—
Norman, Daniel A.; Newton, Ronald R.; Nicholas, Glenn V.; Bellofatto, Steven; and Onody, Stephen K., 4,898,169, Cl. 606-42.000.
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Meguro, Kanji; Fujita, Takeshi; Hatanaka, Chitoshi; and Ooi, Satoru, 4,898,947, Cl. 546-280.000.
Oppermann, Gunter; and Feld, Fritz, to Bayer Aktiengesellschaft. Sensor-controlled hydraulic system with electroviscous fluids. 4,898,084, Cl. 73-118.100.
Opresko, Stephen T., to RCA Licensing Corporation. Material deposition process analysis system. 4,898,746, Cl. 427-10.000.
Orlandi, Arthur A. Storage system and connector for the same. 4,898,286, Cl. 211-187.000.
Orr, Frederick W.: *See*—
Double, Paul B.; Orr, Frederick W.; and Dotterwick, Robert E., 4,897,970, Cl. 52-4.000.
Ortho Pharmaceutical Corporation: *See*—
Murray, William V.; and Wachter, Michael P., 4,898,952, Cl. 548-378.000.
Osabe, Kuniji: *See*—
Sugata, Masao; Den, Tohru; Ito, Susumu; Hirabayashi, Keiji; Ikoma, Keiko; Kurihara, Noriko; Osabe, Kuniji; Takeuchi, Tatsuo; Satomura, Hiroshi; Oguchi, Yoshihiro; Maruyama, Akio; and Saito, Keishi, 4,898,798, Cl. 430-58.000.
Osada, Koji; Date, Haruyuki; Saihara, Yasuhiro; Yamauchi, Toshiyuki; and Koike, Shiro, to Matsushita Electric Works, Ltd. Deodorant and filter using same, as well as method of producing the deodorant. 4,898,727, Cl. 424-76.100.
Osaka, Takaaki; Matsui, Norio; Susaki, Shinichi; and Egawa, Yutaka, to Nippon Telegraph and Telephone. Method of manufacturing an interboard connection terminal. 4,897,918, Cl. 29-830.000.
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Kano, Kiyoshi; Kaku, Nobuyuki; Osawa, Atsuo; Fujimori, Shinya; and Fukagawa, Yoshihiro, 4,899,235, Cl. 360-85.000.
Osawa, Nobuyuki, to Nippon Seiko Kabushiki Kaisha. Linear guide apparatus. 4,898,478, Cl. 384-45.000.
Osawa, Yasuko: *See*—
Narutomi, Yuji; Katsumata, Manabu; Osawa, Yasuko; and Uchikuga, Saburo, 4,898,870, Cl. 514-292.000.
Osborne, William E., to Marlin Firearms Company, The. Firearm safety. 4,897,951, Cl. 42-70.060.
Oshima, Takeshi: *See*—
Morisawa, Yasuhiro; Kataoka, Mitsuru; Sugiyama, Mitsuo; Saito, Fujio; Koike, Hiroyuki; Oshima, Takeshi; Simoji, Yasuo; and Nagahori, Hitoshi, 4,898,862, Cl. 514-236.200.
Otake, Katsumi, to Fuji Photo Film Co., Ltd. Photographic display and apparatus for making elemental prints of the same. 4,897,943, Cl. 40-158.100.
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Toda, Fumio; Tanaka, Kouichi; Taniguchi, Masatoshi; and Sasaoka, Michio, 4,898,654, Cl. 204-157.710.
Torii, Sigeru; Tanaka, Hideo; Tanaka, Motoaki; Yamada, Shozo; and Nakai, Akira, 4,898,939, Cl. 540-310.000.
Otsuka Pharmaceutical Co., Ltd.: *See*—
Fujii, Setsuro; Ishikawa, Hiroshi; Yasumura, Koichi; Jitsukawa, Koichiro; Toyama, Sachio; Tsubouchi, Hidetsugu; Sudo, Kimio; and Tsuji, Kouichi, 4,898,859, Cl. 514-210.000.
Nakai, Satoru; Kaneta, Mayumi; Kikumoto, Yoshikazu; Hong, Yeong-Man; Kawai, Kazuyoshi; Takegata, Setsuko; Ishii, Kiyoshi; Yanagihara, Yasuo; and Hirai, Yoshikatsu, 4,898,818, Cl. 435-69.100.
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Otsuka, Tsutomu; and Otsuki, Etsuo, 4,898,625, Cl. 148-101.000.
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Kawamura, Hideaki; Fujibayashi, Kentaro; and Otsuki, Toshiaki, 4,899,096, Cl. 318-573.000.
Otto Hansel GmbH: *See*—
Hogenkamp, Wilhelm; and Wostbrock, Gert, 4,897,983, Cl. 53-461.000.
Ou, Jung-Hsing; and Wong, Sau-Ching, to Altera Corporation. Bit line sense amplifier for programmable logic devices. 4,899,070, Cl. 307-530.000.
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Breckenfeld, Paul W.; and Broughton, George L., 4,898,134, Cl. 123-195.00R.
Ovadia, David; and Mandler, Ernestine, to Makhteshim Chemical Works, Ltd. Process for manufacturing diazinon. 4,898,942, Cl. 544-243.000.
Overhoff, Mario W. High resolution measurement of moving materials using a scintillation detector. 4,899,298, Cl. 364-558.000.
Ovil, Yoel; and Levy, Morris, to Galil (Naharia) Advanced Technologies Ltd. Suturing implement particularly useful in surgical operations for the attachment of a prosthetic valve. 4,898,155, Cl. 606-144.000.
Owen, Gordon. Display systems. 4,897,948, Cl. 40-661.000.

Owen, Hartley: *See*—
Harandi, Mohsen N.; and Owen, Hartley, 4,899,002, Cl. 585-312.000.
Harandi, Mohsen N.; and Owen, Hartley, 4,899,015, Cl. 585-533.000.
Hsia, Chung H.; Owen, Hartley; and Wright, Bernard S., 4,898,716, Cl. 422-190.000.
Hsia, Chung H.; Owen, Hartley; and Wright, Bernard S., 4,898,717, Cl. 422-190.000.

Owens-Corning Fiberglas Corporation: *See*—
Dunbar, Sidney G., 4,898,770, Cl. 428-283.000.

Owens, James W.: *See*—
Moore, Danny R.; Owens, James W.; and Schoggen, Howard L., 4,898,642, Cl. 162-157.600.

Oyabu, Masaaki: *See*—
Ito, Masazumi; Nishimori, Kadotaro; and Oyabu, Masaaki, 4,899,140, Cl. 340-756.000.

Ozaki, Shinya: *See*—
Odaka, Kentaro; Ozaki, Shinya; Yamada, Masaki; Ishibashi, Hiroshi; and Inazawa, Yoshizumi, 4,899,232, Cl. 360-48.000.

Ozogar, Robert M.: *See*—
Subramaniam, Anandaraman; Ozogar, Robert M.; and Bergsbaken, Carlton K., 4,898,739, Cl. 426-35.000.

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Cusano, Dominic A., 4,898,648, Cl. 204-15.000.
Lubarsky, Daniel P., 4,899,340, Cl. 371-37.100.

Page, Gary L., to Conoco Inc. S-bar refractory anchors with elliptical tab. 4,897,977, Cl. 52-378.000.

Pages, Jean, to Labinal. Devices for eliminating water from diesel oil supplying a diesel engine. 4,898,140, Cl. 123-510.000.

Pakam Data Systems Inc.: *See*—
Pierce, Richard S.; and Van Leeuwen, Willem J., 4,898,167, Cl. 128-205.160.

Pallin, Leslie L.: *See*—
Artwick, Kert E.; Wilkening, Steven R.; and Pallin, Leslie L., 4,897,975, Cl. 52-208.000.

Pallini, Luciano: *See*—
Costanzi, Silvestro; Gusoni, Damiano; and Pallini, Luciano, 4,898,946, Cl. 546-216.000.

Palmer, Larry R., to Tennessee Tool and Engineering, Inc. In line rotary driling machine for producing uniform openings in continuous strip material. 4,898,501, Cl. 408-32.000.

Palmer, Marcia: *See*—
Liggett, Louis; McGuire, Michael; Palmer, Marcia; and DeGiacomo, Ralph, 4,898,744, Cl. 426-557.000.

Pan Electric Corporation: *See*—
Cornell, Paul A., 4,898,551, Cl. 439-789.000.

Panoz, Donald E.; and Geoghegan, Edward J., to Elan Corporation plc. Controlled absorption pharmaceutical composition. 4,898,737, Cl. 424-468.000.

Paradyne Corp.: *See*—
Bottoms, Stanley; and Korzik, James L., 4,898,547, Cl. 439-652.000.

Pardes, Greg, to Reseal International Limited Partnership. Collapsible container for flowable substances. 4,898,306, Cl. 222-206.000.

Pareau, Dominique: *See*—
Chesne, Andre ; Chevalier, Sylvie; Germain, Michel; and Pareau, Dominique, 4,898,963, Cl. 558-146.000.

Park, William R. R.: *See*—
Ziemelis, Maris J.; and Park, William R. R., 4,898,913, Cl. 525-301.000.

Parker, David C.; and Clubley, Brian G., to Ciba-Geigy Corporation. Corrosion inhibitor. 4,898,687, Cl. 252-389.610.

Parsons, Bryan N. V., to Jaguar Cars Limited. Rotary drives. 4,898,042, Cl. 74-68.000.

Parsons, Bryan N. V., to Jaguar Cars Limited. Valve mechanisms. 4,898,130, Cl. 123-90.160.

Partovi, Afshin: *See*—
Cheng, Li-Jen; Gheen, Gregory O.; and Partovi, Afshin, 4,898,436, Cl. 350-3.640.

Pasa, Nelson S., to Threshold Corporation. Active low frequency acoustic resonance suppressor. 4,899,387, Cl. 381-71.000.

Pasternack, Eric S.: *See*—
Hearn, David D.; Pasternack, Eric S.; and Segalman, Daniel J., 4,899,320, Cl. 367-35.000.

Pasternak, Mordechai; and Dorawala, Tansukhlal G., to Texaco Inc. Solvent dewaxing process. 4,898,674, Cl. 210-638.000.

Pastor, Stephen D.: *See*—
Benjamin, Linda A.; Pastor, Stephen D.; and Luzzi, John J., 4,898,980, Cl. 568-23.000.
Ravichandran, Ramanathan; Pastor, Stephen D.; Seltzer, Raymond; and Patel, Ambelal R., 4,898,901, Cl. 524-237.000.

Patel, Ambelal R.: *See*—
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Patel, Girish K.; and Belcher, James H., to Alco Chemical Corporation. Dry microbiocidal composition containing an ethylene bis-dithiocarbamate salt. 4,898,881, Cl. 514-481.000.

Patterson, David W.: *See*—
St. Angelo, Stephen, Jr.; Carver, George C.; Patterson, David W.; and Fremont, Owen K., 4,897,913, Cl. 29-450.000.

Patterson, Gerald A.: *See*—
Ashton, Clint H.; and Patterson, Gerald A., 4,898,067, Cl. 87-8.000.

Paul de la Pena Limited: *See*—
Turner, Anthony P. F.; Swain, Ann; Ramsay, Graham; Cardosi, Marco; and Schneider, Bernard H., 4,898,816, Cl. 435-34.000.

Paulhac, Rene : *See*—
Mazodier, Francois; and Paulhac, Rene , 4,898,013, Cl. 72-165.000.

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Karger, Barry L.; Paulus, Aran; Cohen, Aharon S.; and Nelson, Robert J., 4,898,658, Cl. 204-299.00R.

Pauwels, Bernard: *See*—
Lewyllie, Dirk; Vangheluwe, Jose; Pauwels, Bernard; and Shaw, Henry, 4,898,214, Cl. 139-116.00A.

Paysinger, Joseph R.: *See*—
Crutcher, William C.; and Paysinger, Joseph R., 4,899,322, Cl. 367-59.000.

PCR, Inc.: *See*—
Ollmann, James E.; and DePasquale, Ralph J., 4,898,936, Cl. 536-17.100.

Pechiney: *See*—
Bommier, Christophe; Gimenez, Philippe; Kucza, Jean-Claude; and Rabiet, Jacques, 4,898,646, Cl. 204-1.00T.

Peck, Douglas J., to Emhart Industries, Inc. Vapor phase processing system. 4,897,934, Cl. 34-78.000.

Pedrick, Vincent S.: *See*—
Foster, William A., Jr.; and Pedrick, Vincent S., 4,897,973, Cl. 52-102.000.

Peled, Michael, to Bromine Compounds Ltd. 3,3-oxy-bis{[2,2'-di(-bromomethyl)]}propanoic acid derivatives. 4,898,900, Cl. 524-220.000.

Pelikan Aktiengesellschaft: *See*—
Mecke, Norbert; and Krauter, Heinrich, 4,898,486, Cl. 400-241.200.

Peloquin, Charles A.: *See*—
Stout, Darwin E.; Wilcox, Robert C.; and Peloquin, Charles A., 4,898,274, Cl. 206-289.000.

Penhale, Donald W. H.: *See*—
Heller, Jorge; Penhale, Donald W. H.; and Ng, Steve Y., 4,898,928, Cl. 528-392.000.

Pennwalt Corporation: *See*—
Reilly, James L.; Huber, Ludwig K.; and Leader, Gordon R., 4,899,249, Cl. 361-317.000.

Perceptron, Inc.: *See*—
Waldecker, Thomas J.; Dewar, Robert; Wybo, David R.; and Woroniec, Richard, 4,899,218, Cl. 358-93.000.

Perkins, Harley A., to Northrop Corporation. Path length control system for magnetic mirror dithered ring laser gyros. 4,899,346, Cl. 372-32.000.

Perkinson, Robert H.; Stearns, Charles F.; and Belanger, Rene F., to United Technologies Corporation. Metering valve temperature compensation. 4,898,324, Cl. 236-92.00R.

Perovitch, Phillipe: *See*—
Surugue nee Lasnier, Evelyne; Lasnier, Hubert; and Perovitch, Phillipe, 4,898,572, Cl. 604-4.000.

Perri, Joseph A., to Insul Company, Inc. Lance with metered core for treating molten metal. 4,898,369, Cl. 266-266.000.

Perry, Joseph V.: *See*—
Halberstadt, Louis; Mertinooke, Peter E.; Perry, Joseph V.; and Muessel, Dan C., 4,898,760, Cl. 428-122.000.

Perzborn, Elisabeth: *See*—
Franckowiak, Gerhard; Bechem, Martin; Kayser, Michael; Gross, Rainer; Schramm, Matthias; Seuter, Friedel; Perzborn, Elisabeth; and Thomas, Gunther, 4,898,865, Cl. 514-252.000.

Peters, Alan W.: *See*—
Edwards, Grant C.; and Peters, Alan W., 4,898,846, Cl. 502-67.000.

Peterson, Joe W.: *See*—
Berhmer, Geoffrey E.; and Peterson, Joe W., 4,899,114, Cl. 330-253.000.

Petoca Ltd.: *See*—
Suto, Yoshinori; Ito, Toshiyuki; Nakajima, Hideyuki; Okamura, Keiichiro; Nayuki, Shin-ichi; Ogawa, Hiroyasu; and Enomoto, Harumitsu, 4,898,723, Cl. 423-447.400.

Petre, John H., to Cleveland Clinic Foundation, The. Continuous cardiac output by impedance measurements in the heart. 4,898,176, Cl. 128-642.000.

Petrelli, Robert: *See*—
Bauer, Thomas M.; Hemmeter, Richard W.; Petrelli, Robert; Piereth, Richard J.; and Rubald, Cyrenus M., 4,899,375, Cl. 379-264.000.

Petrolite Corporation: *See*—
Dwivedy, Shailesh G., 4,898,751, Cl. 427-230.000.

Petschauer, Richard J.; and Bergman, Robert J., to Unisys Corporation. Clamping sense amplifier for bipolar ram. 4,899,311, Cl. 365-189.060.

Pfeifer, Josef, to Ciba-Geigy Corporation. Coated material and use thereof. 4,898,806, Cl. 430-325.000.

Pfeiffer, Ludwig; and Werner, Wilfried, to MTS Minitunnelsysteme GmbH. Apparatus for underground tunneling. 4,898,496, Cl. 405-141.000.

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Campbell, Simon F.; Morris, David S.; and Roberts, David A., 4,898,872, Cl. 514-303.000.

Pfoehler, Peter: *See*—
Vietmeier, Juergen; Pfoehler, Peter; Brauch, Gundo; Druschke, Wolfgang; and Zosel, Albrecht, 4,898,909, Cl. 524-820.000.

Pfrimmer-Viggo GmbH & Co. KG: *See*—
Iwatschenko, Peter, 4,898,581, Cl. 604-122.000.

Pham, Hoa V.: *See*—
Ferchau, Joerg U.; Pham, Hoa V.; and Diaz, Randall J., 4,899,254, Cl. 361-384.000.

Pharmetrix Corporation: *See*—
Faste, Rolf A., 4,898,582, Cl. 604-141.000.

Pherigo, Douglas E.: *See*—
VerWeyst, Gordon E.; Burk, Charles E.; and Pherigo, Douglas E., 4,898,292, Cl. 215-237.000.

Philip, James H. Intravenous fluid flow monitor. 4,898,576, Cl. 604-50.000.

Phillippson, Rainer: *See*—
Hempel, Gerhard; Kennecke, Mario; Krieger, Bernhard; Phillippson, Rainer; Triem, Hermann; and Weber, Alfred, 4,898,693, Cl. 260-397.400.

Phillips, George E.; and Griffiths, John M., to Brunswick Corporation. Two-stroke cycle engine with vacuum pulse balancing system. 4,898,127, Cl. 123-73.00A.

Phillips, Gregory R.: *See*—
Leoncavallo, Richard A.; Kover, Linda J.; and Phillips, Gregory R., 4,898,278, Cl. 206-443.000.

Phillips Petroleum Company: *See*—
Yu, Michael C.; Scoggins, Lacey E.; and Reed, Jerry O., 4,898,904, Cl. 524-399.000.

Physical Optics Corporation: *See*—
Jannson, Tommasz; Jannson, Joanna; and Yeung, Peter, 4,898,450, Cl. 350-96.210.

Physician Engineered Products, Inc.: *See*—
Rose, Robert J.; and Sundrud, Larry A., 4,898,166, Cl. 128-205.130.

Piatt, David M.: *See*—
Clauss, Allen D.; Culver, Gayle E.; Piatt, David M.; and Wierenga, Thomas J., 4,898,680, Cl. 252-8.800.

Picanol N. V.: *See*—
Lewyllie, Dirk; Vangheluwe, Jose; Pauwels, Bernard; and Shaw, Henry, 4,898,214, Cl. 139-116.00A.

Picard, Claude, to Societe Nouvelle d'Exploitation La Calhene. Process for sterilizing a tight enclosure and installation for performing this process. 4,898,713, Cl. 422-3.000.

Picker International Inc.: *See*—
Plut, Leonard F.; and Nyman, William F., 4,899,357, Cl. 378-148.000.

Pickering, J. H.; Bhatia, Sushil K.; and Chevrette, Roger, to Dennison Manufacturing Company. Bindable cover folders. 4,898,405, Cl. 281-29.000.

Pierce, Richard S.; and Van Leeuwen, Willem J., to Pakam Data Systems Inc. AIDS protection ventilation system. 4,898,167, Cl. 128-205.160.

Pierce & Stevens Corporation: *See*—
Melber, George E.; and Wolinski, Leon, 4,898,892, Cl. 521-54.000.
Melber, George E.; and Wolinski, Leon, 4,898,894, Cl. 521-54.000.

Piereth, Richard J.: *See*—
Bauer, Thomas M.; Hemmeter, Richard W.; Petrelli, Robert; Piereth, Richard J.; and Rubald, Cyrenus M., 4,899,375, Cl. 379-264.000.

Pilborough, David I., to Renishaw plc. Method of calibration for an automatic machine tool. 4,899,094, Cl. 318-567.000.

Pilkington Visioncare Holdings, Inc.: *See*—
Doshi, Praful, 4,898,695, Cl. 264-2.600.

Pines, Alexander; and Samoson, Ago, to University of California, The Regents of the. Probe for high resolution NMR with sample reorientation. 4,899,111, Cl. 324-321.000.

Pinkhasov, Eduard, to Vapor Technologies Inc. Method of shaping hard difficult-to-roll alloys. 4,898,623, Cl. 148-3.000.

Pioneer Electronic Corporation: *See*—
Araki, Morio; Mori, Shigeto; Kaneko, Michihiro; and Go, Yasunao, 4,899,138, Cl. 340-712.000.
Kuriyama, Kazumi, 4,897,932, Cl. 34-52.000.
Masaki, Naoki; and Yoshida, Masayuki, 4,899,331, Cl. 369-32.000.
Takeya, Noriyoshi; Ishii, Hidehiro; Watanabe, Osamu; Yoshio, Junichi; Katakami, Kazuhiko; and Izumo, Takeshi, 4,899,326, Cl. 369-36.000.

Pioneer Video Corporation: *See*—
Kuriyama, Kazumi, 4,897,932, Cl. 34-52.000.

Piorr, Robert: *See*—
Pruehs, Horst; Schenker, Gilbert; Altenschoepfer, Theodor; and Piorr, Robert, 4,898,621, Cl. 134-25.200.

Pipon, Yves; and Droulon, Georges, to A. & M. Cousin Etablissements Cousin Freres. Reversible endless screw slides authorizing a micro millimetric controlled displacement and including a memory for a vehicle seat. 4,898,356, Cl. 248-429.000.

Pitchen, Philippe: *See*—
Bourzat, Jean-Dominique; Capet, Marc; Cotrel, Claude; Labaudiniere, Richard; Pitchen, Philippe; and Roussel, Gerard, 4,898,871, Cl. 514-300.000.

Pitney Bowes: *See*—
Luperti, Harry E.; Irvine, Robert; and Luvara, Anthony, 4,898,570, Cl. 493-420.000.

Pitney Bowes Inc.: *See*—
Berson, William; Gluck, Julius; Murphy, Patrick; Smith, Christopher D.; and Tran, Duc H., 4,899,172, Cl. 346-76.0PH.

Plank, Uto: *See*—
Neumaier, Anton; Plank, Uto; and Rumpp, Gerhard, 4,898,250, Cl. 173-48.000.

Plasmainvent AG: *See*—
Gruner, Heiko, 4,898,785, Cl. 428-472.000.

Plessey Overseas Limited: *See*—
Jackson, Thomas, 4,899,155, Cl. 341-200.000.

Pleueddemann, Edwin P.; and Revis, Anthony, to Dow Corning Corporation. Organosilicon diamine antimicrobial compound. 4,898,957, Cl. 556-418.000.

Plitt, Uwe: *See*—
Fitzner, Klaus; Betz, Walter; Plitt, Uwe; and Schmitt, Wolfgang, 4,898,087, Cl. 98-40.100.

Plough, Inc.: *See*—
Kingsford, Ted, 4,898,283, Cl. 211-57.100.

Plumer, Mark J. Wheel nut assembly. 4,898,429, Cl. 301-9.0DN.

Plut, Leonard F.; and Nyman, William F., to Picker International Inc. X-ray cone safety plate for x-ray system. 4,899,357, Cl. 378-148.000.

Plutt, Daniel J. Impact indicating golf training device. 4,898,389, Cl. 273-186.00A.

Pneumatic Products Corporation: *See*—
Settlemyer, Bernard W., 4,898,599, Cl. 55-28.000.

Podolak, J. B.; and Saluski, Ronald B., to R. R. Donnelley & Sons Company. Method of and apparatus for converting digital data between data formats. 4,899,146, Cl. 341-51.000.

Poerschke, Karl: *See*—
Asdollahi, Norbert; Poerschke, Karl; Stark, Klaus; and Friedrich, Claus, 4,899,123, Cl. 337-273.000.

Polaroid Corporation: *See*—
Morse, John B., 4,899,244, Cl. 360-133.000.

Polinski, Paul W., Sr., to Hughes Aircraft Company. Low temperature cofired ceramic packages for microwave and millimeter wave gallium arsenide integrated circuits. 4,899,118, Cl. 333-246.000.

Polyplastics Co., Ltd.: *See*—
Sato, Tsunenobu; and Fukui, Kiitiro, 4,898,765, Cl. 428-195.000.

Pomagalski SA: *See*—
Brochand, Max, 4,898,100, Cl. 104-192.000.

Pomies, Jean-Pierre, to Association pour la Rationalisation et la Mecanisation de l'Exploitation Forestiere - A.R.M.E.F. Working head for a tree-shaping machine. 4,898,219, Cl. 144-2.00Z.

Pontes, Manuel: *See*—
Lorenzetti, Victor; and Pontes, Manuel, 4,899,210, Cl. 357-81.000.

Pontoppidan, Eskild; and Fleischer, Willy, to Willy Fleischer; and Metallwarenfabrik GmbH & Co. KG. Desk construction. 4,898,103, Cl. 108-144.000.

Porges, Karl G., to United States of America, Energy. Online capacitive densitometer. 4,899,101, Cl. 324-663.000.

Porta Systems Corp.: *See*—
Neuwirth, Helmuth, 4,899,376, Cl. 379-327.000.

Porter, Neil: *See*—
Ward, John B.; Noble, Hazel M.; Porter, Neil; Fletton, Richard A.; and Noble, David, 4,898,821, Cl. 435-119.000.

Portney, Valdemar. Multifocal ophthalmic lens. 4,898,461, Cl. 351-169.000.

Post, Richard F., to United States of America, Energy. Particle accelerator employing transient space charge potentials. 4,899,084, Cl. 315-111.810.

Potter, David; Provost, Laurence N.; Baron, John M.; Stefanovic, David; Sharakan, Eric D.; Sheppard, David A.; and Isman, Marshall A., to Thinking Machines Corporation. Method and apparatus for operating multi-unit array of memories. 4,899,342, Cl. 371-10.100.

Pottorff, Earl T. Molded plastic air cylinder. 4,898,082, Cl. 92-132.000.

Pouring, Andrew A.: *See*—
Failla, Charles C.; Pouring, Andrew A.; Rankin, Bruce; di Priolo, Carlo L.; McCowan, William; and Gosewisch, Dennis, 4,898,[illegible], Cl. 123-263.000.

Powers, Robert E., Jr.: *See*—
Cimino, William J.; and Powers, Robert E., Jr., 4,899,391, Cl. 382-1.000.

PPG Industries, Inc.: *See*—
Finley, James J., 4,898,789, Cl. 428-623.000.
Finley, James J., 4,898,790, Cl. 428-623.000.

Prevorsek, Dusan C.: *See*—
Kavesh, Sheldon; Prevorsek, Dusan C.; and Harpell, Gary A., 4,897,902, Cl. 28-166.000.

Price, Edgar E. Magneto-optic and fiber-optic digital print head. 4,899,222, Cl. 358-296.000.

Price, George M.: *See*—
Luebke, Clement J.; Slade, Frank A.; Sank, Gerald W.; Grob, James T.; Price, George M.; and Hubbard, Elbert M., 4,898,151, Cl. 126-391.000.

Priesch, Manfred; Rau, Harald; and Weitemeyer, Christian, to Th. Goldschmidt AG. Abhesive coating preparation and method of abhesively coating utensils. 4,898,772, Cl. 428-332.000.

Printware, Inc.: *See*—
Shelander, David J., 4,899,048, Cl. 250-231.0SE.

Prior, Christopher P.: *See*—
Duffy, Stephen A.; Prior, Christopher P.; and Scott, Randal W., 4,898,826, Cl. 435-226.000.

Procter & Gamble Cellulose Company, The: *See*—
Moore, Danny R.; Owens, James W.; and Schoggen, Howard L., 4,898,642, Cl. 162-157.600.

Procter & Gamble Company, The: *See*—
Cox, William A.; Camden, James B.; and Roseberry, George L., 4,898,477, Cl. 383-33.000.
Janusz, John M.; Loomans, Maurice E.; LaHann, Thomas R.; and Kasting, Gerald B., 4,898,887, Cl. 514-617.000.

Proctor & Gamble Company, The: *See*—
Clauss, Allen D.; Culver, Gayle E.; Piatt, David M.; and Wierenga, Thomas J., 4,898,680, Cl. 252-8.800.

Prodigy Systems Corporation: *See*—
Lee, Jeffery H., 4,899,394, Cl. 382-9.000.

Profish International AB: *See*—
Gustavsson, Bert U., 4,897,954, Cl. 43-27.400.

Proprietary Technology, Inc.: *See*—
Bartholomew, Donald D., 4,897,906, Cl. 29-890.900.

Provost, Laurence N.: *See*—
Potier, David; Provost, Laurence N.; Baron, John M.; Stefanovic, David; Sharakan, Eric D.; Sheppard, David A.; and Isman, Marshall A., 4,899,342, Cl. 371-10.100.

Pruehs, Horst; Schenker, Gilbert; Altenschoepfer, Theodor; and Piorr, Robert, to Henkel Kommanditgesellschaft auf Aktien. Use of hydroxyalkyl polyethylene glycol ethers as surfactants in rinse aids for dishwashing machines. 4,898,621, Cl. 134-25.200.

Pryor, Paul L. Locating system for maps and other diagrams and displays. 4,898,537, Cl. 434-130.000.

Pulsar Light of Cambridge Ltd: *See*—
Mardon, Paul F., 4,899,267, Cl. 362-277.000.

Pump Controller Corporation: *See*—
Groshong, Leroy E.; Groshong, Judson C.; and Brawn, R. James, deceased, 4,898,579, Cl. 604-67.000.

Puozzo, Luciano; and Manzin, Maurizio, to Fiat Auto S.p.A. Method for treating large cast iron dies, particularly for vehicle-sheet metal pressing. 4,899,024, Cl. 219-10.410.

Puro Corporation of America: *See*—
Horowitz, Carl; Sanduja, Mohan; and Dichter, Michael, deceased, 4,898,676, Cl. 210-668.000.

QO Chemicals, Inc.: *See*—
Van Horn, Wendell E., 4,898,644, Cl. 203-15.000.

Quakenbush, Laura S.: *See*—
Szuca, Stephen S.; Quakenbush, Laura S.; and Marc, Pierre A., 4,898,609, Cl. 71-105.000.

Quantel Limited: *See*—
Nonweiler, Brian R. G., 4,899,295, Cl. 364-522.000.

Quantum Group, Inc.: *See*—
Goldstein, Mark K.; and Dolnick, Earl M., 4,898,531, Cl. 431-12.000.

Quenneville, Raymond N.: *See*—
Meistrick, Zdenek S.; and Quenneville, Raymond N., 4,898,206, Cl. 137-512.300.

Quick-Rotan Elektromotoren GmbH: *See*—
Hulshoff, Hartmut; Kothe, Peter; Luft, Michael; and Schutz, Ulrich, 4,899,287, Cl. 364-470.000.

R. J. Reynolds Tabacco Company: *See*—
Deal, Philip A., 4,898,190, Cl. 131-336.000.

R. J. Reynolds Tobacco Company: *See*—
Niven, Benjamin F., Jr.; and Mays, Charles D., 4,898,188, Cl. 131-296.000.

R. R. Donnelley & Sons Company: *See*—
Podolak, J. B.; and Saluski, Ronald B., 4,899,146, Cl. 341-51.000.

Raasch, Hans; and Boker, Reinhard, to W. Schlafhorst & Co. Cleaning device for open end spinning rotor. 4,897,993, Cl. 57-302.000.

Rabiet, Jacques: *See*—
Bommier, Christophe; Gimenez, Philippe; Kucza, Jean-Claude; and Rabiet, Jacques, 4,898,646, Cl. 204-1.00T.

Raj, Kuldip; Gowda, Hanumaiah L.; and Moskowitz, Ronald, to Ferrofluidics Corporation. Compact ferrofluidic electrically conducting sealed bearing. 4,898,480, Cl. 384-446.000.

Rajan, John B.; Kumar, Romesh; and Vissers, Donald R., to United States of America, Energy. Process for direct conversion of reactive metals to glass. 4,898,692, Cl. 252-629.000.

Rakel, Jay O.: *See*—
Christensen, Stephen; and Rakel, Jay O., 4,898,754, Cl. 427-369.000.

Ramsay, Graham: *See*—
Turner, Anthony P. F.; Swain, Ann; Ramsay, Graham; Cardosi, Marco; and Schneider, Bernard H., 4,898,816, Cl. 435-34.000.

Ramun, John R., to Allied Gator Inc. Metal cutting shear with changeable multiple cutting edge portions. 4,897,921, Cl. 30-134.000.

Randhawa, Harbhajan S., to Vac-Fec Systems, Inc. Layered structure for adhering gold to a substrate and method of forming such. 4,898,768, Cl. 428-216.000.

Rankin, Bruce: *See*—
Failla, Charles C.; Pouring, Andrew A.; Rankin, Bruce; di Priolo, Carlo L.; McCowan, William; and Gosewisch, Dennis, 4,898,135, Cl. 123-263.000.

Rappoldt, Louis M.; and DeHaan, Peter H., to Nederlandse Organisatie voor Toegepastnatuurwetenschappelijk Onderzoek TNO. Filter device. 4,898,105, Cl. 110-245.000.

Rasch, Diane M.; and Fiedler, Lawrence D., to Dow Corning Corporation. Thermally stable fluorinated organosiloxane gel composition. 4,898,903, Cl. 524-398.000.

Raschella, Domenick L.: *See*—
Cavagna, Giancarlo A.; Groome, Ernest J.; Murphy, Joseph M.; and Raschella, Domenick L., 4,898,752, Cl. 427-265.000.

Rasmussen, Jerald K.: *See*—
Katritzky, Alan R.; Krepski, Larry R.; Rasmussen, Jerald K.; Heilmann, Steven M.; and Tarr, Richard D., 4,898,923, Cl. 528-73.000.

Rassmusen GmbH: *See*—
Zeidler, Siegmund, 4,898,407, Cl. 285-328.000.

Rau, Harald: *See*—
Priesch, Manfred; Rau, Harald; and Weitemeyer, Christian, 4,898,772, Cl. 428-332.000.

Rauber, Walter: *See*—
Frey, Yvonne; Kutzli, Jorg; Rauber, Walter; Schmocker, Hans; and Tobler, Markus, 4,898,098, Cl. 102-334.000.

Raudabaugh, Donald E., to Hubbell Incorporated. Modular electrical assemblies with plastic film barriers. 4,899,248, Cl. 361-127.000.

Rauschenbach, Kurt; and Lee, Charles A., to Cornell Research Foundation. Self-aligned, high resolution resonant dielectric lithography. 4,898,804, Cl. 430-311.000.

Ravichandran, Ramanathan; Pastor, Stephen D.; Seltzer, Raymond; and Patel, Ambelal R., to Ciba-Geigy Corporation. Long chain N-alkyl-alpha-alkyl nitrones and polyolefin compositions stabilized therewith. 4,898,901, Cl. 524-237.000.

Ray, Roger E.: *See*—
Einolf, Charles W., Jr.; Shutterly, Harold B.; Sun, Shan C.; Gonnam, Russel W.; Ray, Roger E.; Koch, Karl C.; and Maynard-Nenno, Pamela M., 4,899,383, Cl. 380-48.000.

Raychem Limited: *See*—
Towle, Ian D. H., 4,898,983, Cl. 568-322.000.

Rayfield, Jerry W.; Baker, Robert; and Weber, Kenneth E., to ECCA Calcium Products, Inc. Dry ground/wet ground calcium carbonate filler compositions. 4,898,620, Cl. 106-464.000.

Raytheon Company: *See*—
Kliger, Isaac E.; and Beckerleg, Richard A., 4,898,340, Cl. 244-3.110.
Terzian, John, 4,898,341, Cl. 244-3.160.

Razzano, John S.: *See*—
Fitzgerald, Thomas H.; Razzano, John S.; and Stegman, Todd R., 4,898,898, Cl. 523-351.000.

RCA Licensing Corporation: *See*—
Opresko, Stephen T., 4,898,746, Cl. 427-10.000.

Reader, John R., Jr.: *See*—
Hendrick, Kendall B.; and Reader, John R., Jr., 4,899,102, Cl. 324-663.000.

Reading, Kirsten L.: *See*—
Baile, Gnaneshwar R.; McVannel, Donald E.; Reading, Kirsten L.; and Hall, Ginger L., 4,898,961, Cl. 556-479.000.

Rearigh, Alfred R. Identification card. 4,899,038, Cl. 235-493.000.

Reboul, Michel; and Glachet, Charles, to Commissariat A L'Energie Atomique; and Euritech. Connector device for two reactor containments. 4,897,963, Cl. 49-507.000.

Reckitt & Colman Products Limited: *See*—
Fox, Rodney T.; and Goreham, Philip W., 4,898,328, Cl. 239-6.000.

Redmond, Russell J.: *See*—
Borsanyi, Alexander S.; and Redmond, Russell J., 4,898,583, Cl. 604-153.000.
Borsanyi, Alexander S.; Redmond, Russell J.; Vidal, Claude A.; and Spaeth, Edmund E., 4,898,584, Cl. 604-153.000.

Reece, Vernon E. Sifter for use in separating dough balls from breading. 4,898,664, Cl. 209-235.000.

Reed, Jerry O.: *See*—
Yu, Michael C.; Scoggins, Lacey E.; and Reed, Jerry O., 4,898,904, Cl. 524-399.000.

Reed Tool Company Limited: *See*—
Barr, John D., 4,898,252, Cl. 175-379.000.

Reemay, Inc.: *See*—
Dunaway, Jerry A.; Zimmerman, Leon H.; and LaTondress, Nancy T., 4,898,761, Cl. 428-137.000.

Reichmann, Mark G.: *See*—
Amelse, Jeffrey A.; and Reichmann, Mark G., 4,899,010, Cl. 585-480.000.

Reif, Stefan: *See*—
Kicherer, Robert; Schreder, Felix; and Reif, Stefan, 4,899,033, Cl. 219-451.000.

Reilly, James L.; Huber, Ludwig K.; and Leader, Gordon R., to Pennwalt Corporation. Fluorine-containing dielectric media and capacitors employing such media. 4,899,249, Cl. 361-317.000.

Reinecke, Paul: *See*—
Buchel, Karl H.; Holmwood, Graham; Kraatz, Udo; Kramer, Wolfgang; Reinecke, Paul; Brandes, Wilhelm; and Stendel, Wilhelm, 4,898,875, Cl. 514-383.000.

Reinhold, Albert, to Feinfocus Rontgensysteme GmbH. Roentgen lithography method and apparatus. 4,899,354, Cl. 378-34.000.

Reinker, Joseph F., Jr.: *See*—
Fournier, Paul J. E.; and Reinker, Joseph F., Jr., 4,898,211, Cl. 137-615.000.

Reinsch, James W.: *See*—
Albarella, James P.; Charlton, Steven C.; Reinsch, James W.; and Warchal, Mary E., 4,898,813, Cl. 435-4.000.

Reiser, Wolf: *See*—
Mohrmann, Karl H.; Reiser, Wolf; Linke, Siegfried W.; and Zerbes, Rudolf, 4,898,954, Cl. 549-519.000.

Reist, Walter, to Ferag AG. Apparatus for the continuous winding-up or winding-off of substantially flat structures into a package and from a package, respectively. 4,898,336, Cl. 242-59.000.

Reliance Comm/Tec Corporation: *See*—
Ayer, George E., 4,898,550, Cl. 439-718.000.

Remington, Robert W., to Wimer, Claude R., Jr., a part interest. Center of gravity holster. 4,898,310, Cl. 224-238.000.

Renaco AS: *See*—
Kristiansen, Cato, 4,898,273, Cl. 206-204.000.

Renishaw plc: *See*—
Pilborough, David I., 4,899,094, Cl. 318-567.000.

Reseal International Limited Partnership: *See*—
Pardes, Greg, 4,898,306, Cl. 222-206.000.

Research Corporation Technologies, Inc.: *See*—
Oglevee, J. Robert; and Craig, Richard, 4,897,957, Cl. 47-58.000.

Research Foundation of the State University of N.Y.: *See*—
Andors, Leonard, 4,898,590, Cl. 604-198.000.

Revel, Michel: *See*—
Lavie, David; Revel, Michel; Rotman, Dalia; and Velde, Vincent V., 4,898,891, Cl. 514-732.000.

Revis, Anthony: *See*—
Pleueddemann, Edwin P.; and Revis, Anthony, 4,898,957, Cl. 556-418.000.

Reynolds, Charles E. Portable working chute system. 4,898,121, Cl. 119-98.000.

Reynolds, Patricia A.: *See*—
Hershberger, Charles L.; Larson, Jeffrey L.; and Reynolds, Patricia A., 4,898,828, Cl. 435-252.300.

Rheinmetall GmbH: *See*—
Gropp, Heiko U., 4,898,072, Cl. 89-45.000.

Rhoades, John J.: *See*—
Holoubek, George H.; Rhoades, John J.; and Whitaker, George P., 4,898,708, Cl. 264-515.000.

Rhoades, Mark L.: *See*—
Bates, Keith A.; Budd, Russell A.; Habegger, Millard A.; and Rhoades, Mark L., 4,899,327, Cl. 369-45.000.

Rhone-Poulenc Sante: *See*—
Bourzat, Jean-Dominique; Capet, Marc; Cotrel, Claude; Labaudiniere, Richard; Pitchen, Philippe; and Roussel, Gerard, 4,898,871, Cl. 514-300.000.

Rhone-Poulenc Specialities Chimiques: *See*—
Linossier, Jean-Louis, 4,898,819, Cl. 435-93.000.

Rice, Wayne K.; and Singh, Laxman, to Vitamins, Inc. Dynamic supercritical fluid extraction system. 4,898,673, Cl. 210-634.000.

Riceman, Robert G., to Scheer, Donald J. Safety cover for electrical receptacles. 4,899,019, Cl. 174-67.000.

Rich, John W. Vehicle support assembly. 4,898,019, Cl. 72-461.000.

Richard Wolf GmbH: *See*—
Messroghli, Hossein; and Boebel, Manfred, 4,898,157, Cl. 606-147.000.

Richardson, James E. In-store refrigerated display system. 4,898,004, Cl. 62-255.000.

Richeson, Donald E.: *See*—
Wells, Hoyt M.; Determan, William J.; Vanis, Vernon V.; Hrivnak, John E.; Richeson, Donald E.; and Saupe, Timothy P., 4,898,703, Cl. 264-166.000.

Richison, David E., to Richison Industries Incorporated. Adjustable fitting for fireplace insert flue connection. 4,898,154, Cl. 126-500.000.

Richison Industries Incorporated: *See*—
Richison, David E., 4,898,154, Cl. 126-500.000.

Richman, Philip: *See*—
Clark, Keith R.; and Richman, Philip, 4,899,016, Cl. 585-826.000.

Ricoh Company, Ltd.: *See*—
Hata, Daisuke, 4,899,190, Cl. 354-400.000.
Inoue, Motoichiro, 4,899,182, Cl. 346-153.100.
Kiya, Yukitoshi; and Shimada, Kazuyuki, 4,899,348, Cl. 372-38.000.
Shibata, Isamu; Asai, Takahiro; Nagasawa, Kiyoto; and Asada, Kenichirou, 4,899,344, Cl. 372-29.000.
Shimada, Tomoyuki; Sasaki, Masaomi; Hashimoto, Mitsuru; and Aruga, Tamotsu, 4,898,800, Cl. 430-59.000.

Ricoh Electronics, Inc.: *See*—
Shibata, Tomoo, 4,898,848, Cl. 503-200.000.

Riedle, Armin; and Zientek, Horst, to Total Walther Feuerschutz GmbH. Quick release valve for sprinkler head. 4,898,246, Cl. 169-38.000.

Riehl, Tilford F.: *See*—
Johnson, Robert R.; and Riehl, Tilford F., 4,898,191, Cl. 131-359.000.

Ries, Stuart W.; and Shembarger, Irene M., to Whirlpool Corporation. Dryer drum lamp assembly. 4,899,264, Cl. 362-92.000.

Rieter Machine Works, Ltd.: *See*—
Staheli, Paul, 4,897,897, Cl. 19-114.000.

Rifar S.r.L.: *See*—
Marsili, Leonardo, 4,898,938, Cl. 540-230.000.

Riggins, Phillip H.; and Hauser, Peter J., to Burlington Industries, Inc. Exhaust process for simultaneously dyeing and improving the flame resistance of aramid fibers. 4,898,596, Cl. 8-490.000.

Rigling, Walter S. Multilayer printed wiring registration method and apparatus. 4,898,636, Cl. 156-626.000.

Riley, Dennis P.: *See*—
Fields, Donald L., Jr.; Grabiak, Raymond C.; and Riley, Dennis P., 4,898,972, Cl. 562-17.000.

Rimay, Bela: *See*—
Antal, Kalman; Rimay, Bela; and Halasz, Ferenc, 4,898,554, Cl. 445-6.000.

Ritsko, Joseph E.; Johnson, Walter A.; and Kopatz, Nelson E., to GTE Products Corporation. Method for producing aluminum oxide coated cobalt powder. 4,898,749, Cl. 427-216.000.

Robbins, Daniel H.; Wirtz, John S.; Lein, Juergen; and Brookmire, Michael A., to Itek Graphic Corp. Low cost color scanner. 4,899,214, Cl. 358-75.000.

Robbins, W. Dale: *See*—
Leone, David A.; Moody, G. Lawrence; Holland, William D.; Bell, Mark E.; and Robbins, W. Dale, 4,899,022, Cl. 200-50.00A.

Roberts, Christopher W. Hypodermic syringe splatter shield. 4,898,588, Cl. 604-187.000.

Roberts, David A.: *See*—
Campbell, Simon F.; Morris, David S.; and Roberts, David A., 4,898,872, Cl. 514-303.000.

Roberts, Edgar P., Jr.: *See*—
Beard, Bryce P., III; Kluttz, James W.; and Roberts, Edgar P., Jr., 4,898,388, Cl. 273-181.00R.

Robertshaw Controls Company: *See*—
Kadwell, Brian J.; Fowler, Daniel L.; and Gawron, Gregory F., 4,899,034, Cl. 219-494.000.

Robertson, Kenneth L., to Ken-Koat, Inc. Electrostatic coating of rubber-to-metal adhesives on metal parts. 4,898,747, Cl. 427-31.000.

Robinson, Alan: *See*—
Scanlan, Ian F.; and Robinson, Alan, 4,898,442, Cl. 350-96.150.

Robinson, Kelly S.: *See*—
Gruenbaum, William T.; Mey, William; and Robinson, Kelly S., 4,898,797, Cl. 430-51.000.

Roche, Jean J. Roundabout with climbing effect fitted with an airplane. 4,898,377, Cl. 272-36.000.

Rockwell-CIM: *See*—
Bertolini, Carlo, 4,898,413, Cl. 292-336.300.

Roediger, Gary A., to American Telephone and Telegraph Company AT&T Bell Laboratories. Architecture of the control of a high performance packet switching distribution network. 4,899,333, Cl. 370-60.000.

Roehringer, Arno, to Daimler-Benz AG. Servo-valve arrangement for power steering. 4,898,074, Cl. 91-371.000.

Roehrs, Don P.; and Granberg, Helge O., to Signal One Corporation. Apparatus and method for paralleling power field effect transistors in high frequency amplifiers. 4,899,116, Cl. 330-251.000.

Rohm GmbH Chemische Fabrik: *See*—
Siol, Werner; and Terbrack, Ulrich, 4,898,912, Cl. 525-199.000.

Rohner, Joachim, deceased (by Rohner, Jutta, heir); Langen, Manfred; and Gebald, Gregor, to Zinser Textilmaschinen GmbH; and Innovatex Unternehemensberatung GmbH. Method and apparatus for automatic orderly removal and collection of fully-spun cops from textile ring spinning machines. 4,897,991, Cl. 57-281.000.

Rohner, Jutta, heir: *See*—
Rohner, Joachim, deceased; Langen, Manfred; and Gebald, Gregor, 4,897,991, Cl. 57-281.000.

Rohr, Wolfgang: *See*—
Keil, Michael; Jahn, Dieter; Becker, Rainer; Rohr, Wolfgang; and Wuerzer, Bruno, 4,898,610, Cl. 71-121.000.

Rojey, Alexandre: *See*—
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Rosen, Har'el; and Rosen, Arye, 4,899,204, Cl. 357-30.000.

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Kasafirek, Evzen; Rybak, Miroslav; Krejci, Ivan; Sturc, Antonin; Roubalova, Alena; Vanzura, Jiri ; Krepela, Evzen; and Bartik, Michal, 4,898,930, Cl. 530-332.000.

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Singh, Prabhakar; Ruka, Roswell J.; and George, Raymond A., 4,898,792, Cl. 429-19.000.

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Granberg, Dirk N.; Suchomel, Frank H.; and Ryno, Robert W., 4,898,124, Cl. 122-382.000.

Ryobi Ltd.: *See—*
Doumoto, Hideki; and Kimura, Takashi, 4,898,094, Cl. 101-485.000.

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SAES Getters SpA: *See—*
Doni, Fabrizio; and Ferrario, Bruno, 4,898,147, Cl. 126-200.000.

Safe/Stress, Inc.: *See—*
Edwards, Marysue; and Dubrinsky, Max M., 4,898,378, Cl. 272-69.000.

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Osato, Yoichi; Saito, Ichiro; and Takasu, Yoshio, 4,899,168, Cl. 346-1.100.

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Kitano, Hirohisa; Saito, Itaru; Matsubara, Ken; Shingaki, Kouichi; and Masuda, Tomohiko, 4,899,183, Cl. 346-154.000.

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Sugata, Masao; Den, Tohru; Ito, Susumu; Hirabayashi, Keiji; Ikoma, Keiko; Kurihara, Noriko; Osabe, Kuniji; Takeuchi, Tatsuo; Satomura, Hiroshi; Oguchi, Yoshihiro; Maruyama, Akio; and Saito, Keishi, 4,898,798, Cl. 430-58.000.

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Kiyohara, Kazuto; Yamazaki, Toshiaki; Harada, Ichiya; Nakadate, Takanori; Noguchi, Kentaro; Nakano, Michiteru; Sakae, Shigeru; and Okuma, Kazuhiro, 4,898,897, Cl. 523-343.000.

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Okamoto, Tsuneo; and Sakaguchi, Yasuo, 4,898,533, Cl. 432-58.000.

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Saeki, Takashi; Nii, Takayuki; Fukui, Hirotake; Mishina, Toshiro; Nakano, Haruo; and Sakakibara, Hitoshi, 4,899,158, Cl. 342-44.000.

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Otake, Katsumi; Sakamoto, Kiichiro; and Kogane, Mikio, 4,897,944, Cl. 40-159.000.

Sakamoto, Takashi; and Kitagawa, Kazumaro, to Anritsu Corporation. Optical time domain reflectometer with automatic measuring function of optical fiber defects. 4,898,463, Cl. 356-73.100.

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Suzukamo, Gohfu; Sakito, Yoji; Fukao, Masami; and Hagiya, Koji, 4,898,655, Cl. 204-157.870.

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Kubo, Masashige; Sakka, Hideo; and Tsutsumi, Yukihiro, 4,898,998, Cl. 570-204.000.

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McDonald, Edward; and Salmon, Roger, 4,898,968, Cl. 560-124.000.

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Podolak, J. B.; and Saluski, Ronald B., 4,899,146, Cl. 341-51.000.

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Pines, Alexander; and Samoson, Ago, 4,899,111, Cl. 324-321.000.

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Sanada, Makoto; Yamashita, Hiroshi; Izawa, Shinichiro; and Hamamoto, Toshikazu, to Honda Giken Kogyo K.K. Valve actuating mechanism for internal combustion mechanism. 4,898,131, Cl. 123-90.440.

Sanchez, Candido O.: *See—*
Johnson, Charles G.; and Sanchez, Candido O., 4,898,678, Cl. 210-741.000.

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Hawkins, Brian; Greenberg, Jerald; Alon, Ofer; Marten, Victor; Banyai, Edward; Edwards, Jennifer A.; Banyai, David M.; Sanchez, Juan C.; Sitnik, Eran; and Yozzo, Joseph A., 4,898,182, Cl. 128-707.000.

Sanders, Andrea; and Himes, Glenn R., to Shell Oil Company. Tie layer composition and laminated structures containing same. 4,898,784, Cl. 428-412.000.

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Knifton, John F.; and Sanderson, John R., 4,898,995, Cl. 568-798.000.

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Beard, Marian H.; Caro, Perry A.; Hsiao, Jennifer B.; Mackey, Kevin J.; Sandman, James G., Jr.; Steinbach, Gary R.; and Woods, Donald R., 4,899,136, Cl. 340-706.000.

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Heller, Jorge; Penhale, Donald W. H.; and Ng, Steve Y., 4,898,928, Cl. 528-392.000.

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Daglow, Terry D.; and Sandstrom, Richard D., 4,898,173, Cl. 128-419.00P.
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Horowitz, Carl; Sanduja, Mohan; and Dichter, Michael, deceased, 4,898,676, Cl. 210-668.000.
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Bystrom, Olof L.; and Johansson, Sven-Erik V., 4,898,054, Cl. 82-160.000.
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Morisawa, Yasuhiro; Kataoka, Mitsuru; Sugiyama, Mitsuo; Saito, Fujio; Koike, Hiroyuki; Oshima, Takeshi; Simoji, Yasuo; and Nagahori, Hitoshi, 4,898,862, Cl. 514-236.200.
Sano, Teruo; and Shioya, Masaharu, to Casio Computer Co., Ltd. Manually sweeping apparatus with image sensor. 4,899,228, Cl. 358-473.000.
Sano, Yoshiaki: *See*—
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Kanno, Isao, 4,898,132, Cl. 123-179.00B.
Torigai, Katsumi; and Takahashi, Masanori, 4,898,563, Cl. 440-1.000.
Sansone, Michael J., to Hoechst Celanese Corporation. N-substituted polybenzimidazole polymer. 4,898,917, Cl. 525-420.000.
Santel, Hans-Joachim: *See*—
Sasse, Klaus; Fischer, Reiner; Santel, Hans-Joachim; and Schmidt, Robert R., 4,898,608, Cl. 71-94.000.
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Fujinuma, Chikao; Sekikawa, Nobuyuki; Tabata, Teruo; Takada, Tadayoshi; Sano, Yoshiaki; and Sadakata, Toshimasa, 4,898,839, Cl. 437-33.000.
Fukui, Kensuke, 4,898,254, Cl. 177-210.00C.
Ito, Junya; Chiba, Akihiko; Oku, Masuo; and Komada, Hitoshi, 4,897,933, Cl. 34-58.000.
Ito, Kiyotaka, 4,897,915, Cl. 29-603.000.
Kamioka, Yosio; Hineno, Kazuhiro; and Kanazawa, Tuneo, 4,898,268, Cl. 198-345.000.
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Tsuchiyama, Yuji; and Shimizu, Masayuki, 4,898,230, Cl. 165-12.000.
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Fencl, Zdenek; Janda, Frantisek; Kovarik, Karel; Sara, Jiri ; and Tatoun, Antonin, 4,898,006, Cl. 62-48.200.
Sarto, Julius A.: *See*—
Hawkinson, Rodney B.; and Sarto, Julius A., 4,898,282, Cl. 211-49.100.
Sartor, Mariano, to Nordica S.p.A. Ski boot with heel securing device. 4,897,940, Cl. 36-119.000.
Sartorius GmbH: *See*—
Oldendorf, Christian; Melcher, Franz-Josef; and Berg, Christoph, 4,898,253, Cl. 177-25.130.
Sasaki, Hideo, to Taisei Road Construction Company, Ltd. Plant of batch system for producing a composite paving material by using a bituminous waste pavement material. 4,898,472, Cl. 366-18.000.
Sasaki, Masaomi: *See*—
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Toda, Fumio; Tanaka, Kouichi; Taniguchi, Masatoshi; and Sasaoka, Michio, 4,898,654, Cl. 204-157.710.
Sask, David, to Downhole Systems Technology Canada. Drill stem testing system. 4,898,236, Cl. 166-65.100.
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Sato, Kazuhiro: *See*—
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Matsumura, Mitsuie; Tanaka, Toshihide; Urushibata, Hiroaki; and Sato, Kazunao, 4,898,793, Cl. 429-38.000.
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Itoh, Seiga; Takeichi, Yasutoshi; and Sato, Moriyuki, 4,898,931, Cl. 530-351.000.
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Haga, Toru; Nagano, Eiki; Morita, Kouichi; and Sato, Ryo, 4,898,948, Cl. 548-171.000.
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Ito, Shigeo; Imaeda, Toshihiko; Takagi, Ryuhei; and Sato, Ryutaro, 4,898,317, Cl. 228-41.000.
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Tasaki, Yoji; Kurokawa, Koichi; Hattori, Katsuhide; Takano, Mikio; Miyajima, Toshikazu; Sato, Toshifumi; and Ogasawara, Katsura, 4,898,095, Cl. 102-201.000.
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Yoshiike, Yoshiji; and Satou, Yoshinori, 4,899,090, Cl. 315-335.000.
Saucy, Gabriel G.: *See*—
Chan, Ka-kong; and Saucy, Gabriel G., 4,898,953, Cl. 549-408.000.
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Grimes, Gary J.; Haas, Lawrence J.; and Sauer, Jon R., 4,898,444, Cl. 350-96.150.
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Wells, Hoyt M.; Determan, William J.; Vanis, Vernon V.; Hrivnak, John E.; Richeson, Donald E.; and Saupe, Timothy P., 4,898,703, Cl. 264-166.000.
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Brunner, Heinz; and Sauter, Karl-Jurgen, 4,898,337, Cl. 242-151.000.
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Halloran, Daniel J.; Kasprzak, Kenneth A.; Savastano, Stefano G.; and Swihart, Terence J., 4,898,614, Cl. 106-3.000.
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Colli, Luigi; Badiali, Roberto; and Marangone, Nereo, 4,899,286, Cl. 364-470.000.
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Seiersen, Ole S., 4,899,271, Cl. 363-126.000.
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Buchecker, Richard; Germann, Alfred; Kelly, Stephen; and Schadt, Martin, 4,898,455, Cl. 350-350.00R.
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Vetter, Ulrich, 4,897,964, Cl. 51-5.00D.
Scheer, Donald J.: *See*—
Riceman, Robert G., 4,899,019, Cl. 174-67.000.
Schenker, Gilbert: *See*—
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Hempel, Gerhard; Kennecke, Mario; Krieger, Bernhard; Phillippson, Rainer; Triem, Hermann; and Weber, Alfred, 4,898,693, Cl. 260-397.400.
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Wright, Oliver; and Janssen, Sylvain, 4,899,046, Cl. 250-227.000.

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Schlumberger, Etienne; and Schlumberger, Maurice, 4,899,318, Cl. 367-8.000.

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Frey, Yvonne; Kutzli, Jorg; Rauber, Walter; Schmocker, Hans; and Tobler, Markus, 4,898,098, Cl. 102-334.000.

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Marechal, Claude; and Schmuckle, Christian, 4,899,037, Cl. 235-493.000.

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Kranz, Walter; and Schnabele, Werner, 4,898,342, Cl. 244-3.210.

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Bitter, Ingrid; Scholz, Wolfhard; and Schneider, Werner, 4,898,690, Cl. 252-554.000.

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Havenstein, Alfred G.; Kahle, Werner; and Schnell, Dagmar, 4,898,740, Cl. 426-106.000.

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Mannl, Reinhard, 4,898,605, Cl. 65-113.000.

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Franckowiak, Gerhard; Bechem, Martin; Kayser, Michael; Gross, Rainer; Schramm, Matthias; Seuter, Friedel; Perzborn, Elisabeth; and Thomas, Gunther, 4,898,865, Cl. 514-252.000.
Meyer, Horst; Schwenner, Eckhard; Bechem, Martin; Gross, Rainer; Schramm, Matthias; Kayser, Michael; and Hebisch, Siegbert, 4,898,877, Cl. 514-521.000.

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Kicherer, Robert; Schreder, Felix; and Reif, Stefan, 4,899,033, Cl. 219-451.000.

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Sleegers, Franciscus T.; Schuitmaker, Pieter D.; and Janssen, Peter J. M., 4,899,329, Cl. 369-275.000.

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Stankowiak, Achim; and Schulz, Hildegard, 4,898,992, Cl. 568-618.000.

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Klose, Hans-Peter; Konig, Kurt; and Schwartz, Wolfgang, 4,899,068, Cl. 307-494.000.

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Frey, Yvonne; Kutzli, Jorg; Rauber, Walter; Schmocker, Hans; and Tobler, Markus, 4,898,098, Cl. 102-334.000.

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Meyer, Horst; Schwenner, Eckhard; Bechem, Martin; Gross, Rainer; Schramm, Matthias; Kayser, Michael; and Hebisch, Siegbert, 4,898,877, Cl. 514-521.000.

Scoggins, Lacey E.: *See*—
Yu, Michael C.; Scoggins, Lacey E.; and Reed, Jerry O., 4,898,904, Cl. 524-399.000.

Scott, Loren W.: *See*—
Hunter, Edwin J.; and Scott, Loren W., 4,898,332, Cl. 239-240.000.

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Duffy, Stephen A.; Prior, Christopher P.; and Scott, Randal W., 4,898,826, Cl. 435-226.000.

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Newman, David A.; Laubengayer, William R.; and Scott, William B., Jr., 4,899,174, Cl. 346-107.00R.

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Wallace, Elmer E., 4,898,204, Cl. 137-505.410.

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Chakrabarti, Amiya K.; Kuhlmass, George W., Jr.; and Seagle, Stanley R., 4,898,624, Cl. 148-1[illegible]50F.

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Sperry, Lawrence B.; and Ruddy, Henry J., 4,898,327, Cl. 239-1.000.

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Hearn, David D.; Pasternack, Eric S.; and Segalman, Daniel J., 4,899,320, Cl. 367-35.000.

Segawa, Yorihide: *See*—
Kuroda, Michio; Sato, Isao; Ishibashi, Yoji; Uchiyama, Yoshihiro; Ohmori, Takashi; Akatsu, Shigeyuki; Kato, Fumio; Segawa, Yorihide; and Iizuka, Nobuyuki, 4,898,001, Cl. 60-733.000.

Seidel, Kurt: *See*—
Hoeffkes, Horst; Seidel, Kurt; Giede, Karl; Struve, Alfred; and Gruber, Bert, 4,898,725, Cl. 424-70.000.

Seider, Werner: *See*—
Weisshuhn, Elmer; Bubik, Alfred; Dahl, Hans; Holik, Herbert; Kurtz, Rudiger; Zembrot, Anton; Stotz, Wolf-Gunter; Seider, Werner; and Trondle, Robert, 4,898,643, Cl. 162-259.000.

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Morozumi, Shinji; Misawa, Toshiyuki; and Nakazawa, Yoshio, 4,899,141, Cl. 340-784.000.
Takei, Katsumori, 4,899,169, Cl. 346-742.000.
Seiko Instruments Inc.: *See*—
Nakabayashi, Yasushi, 4,899,353, Cl. 377-28.000.
Seip, Hermann; Wagner, Wilfried; and Jakobi, Ralf, to Alfred Teves GmbH. Vacuum brake force booster for use with automotive vehicles. 4,898,073, Cl. 91-369.200.
Seitz, Michael E. A., to Standard Register Company, The. Production of microcapsules. 4,898,780, Cl. 428-402.210.
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Ishibashi, Genichi; Kamano, Hideyuki; and Seki, Masahiko, 4,898,600, Cl. 55-222.000.
Seki, Yukio: *See*—
Tachibana, Hidekiyo; Noda, Akihiko; Terao, Kazuo; Honjou, Toshio; Seki, Yukio; Endo, Hiroshi; and Yokobari, Toshio, 4,898,801, Cl. 430-106.600.
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Onouchi, Takashi; Sugai, Hironori; Sekiguchi, Kazuo; Hosoda, Yoshikazu; and Yoshida, Eiichi, 4,898,781, Cl. 428-402.220.
Sekiguchi, Sadayoshi: *See*—
Takenaka, Yoshinori; Fukumi, Hirokazu; and Sekiguchi, Sadayoshi, 4,898,573, Cl. 604-6.000.
Sekikawa, Nobuyuki: *See*—
Fujinuma, Chikao; Sekikawa, Nobuyuki; Tabata, Teruo; Takada, Tadayoshi; Sano, Yoshiaki; and Sadakata, Toshimasa, 4,898,839, Cl. 437-33.000.
Takeda, Kazuo; Sekikawa, Nobuyuki; Hayasaka, Katsuhiro; Fujunuma, Chikao; Itoh, Nobuo; and Kubota, Tetsuya, 4,898,837, Cl. 437-31.000.
Sekine, Satoshi: *See*—
Matushita, Fumio; Akashi, Kageyasu; and Sekine, Satoshi, 4,898,843, Cl. 501-136.000.
Sekiyama, Shigeo; Nihongi, Shigeru; and Mogami, Sadatoshi, to Isuzu Motors Limited. Turbo compound engine. 4,897,998, Cl. 60-614.000.
Seko, Kenji: *See*—
Hoshino, Masahiro; Kobayashi, Isao; Seko, Kenji; Iwasawa, Naozumi; Akaki, Yuu; and Kondo, Toshio, 4,898,656, Cl. 204-181.100.
Sekozawa, Teruji: *See*—
Onari, Mikihiko; Sekozawa, Teruji; and Funabashi, Motohisa, 4,899,280, Cl. 364-431.050.
Selby, Paul H., III: *See*—
Schiavo, Anthony P.; Selby, Paul H., III; and Gibson, Harold L., 4,899,147, Cl. 341-60.000.
Seltzer, Raymond: *See*—
Ravichandran, Ramanathan; Pastor, Stephen D.; Seltzer, Raymond; and Patel, Ambelal R., 4,898,901, Cl. 524-237.000.
Senco Products, Inc.: *See*—
McLaughlin, John E.; and McCardle, Thomas A., 4,898,316, Cl. 227-120.000.
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Imai, Tsutomu; and Sengoku, Norio, 4,899,251, Cl. 361-346.000.
Sentoku, Hideshi; and Asaoka, Takayoshi, to Laurel Bank Machines Co. Ltd. Coin receiving and wrapping apparatus. 4,897,984, Cl. 53-501.000.
Serikawa, Mitsuhiko: *See*—
Takewa, Hiroyuki; Serikawa, Mitsuhiko; Ishikawa, Seiichi; Usuki, Sawako; Kimura, Yoichi; and Obata, Shuichi, 4,899,390, Cl. 381-154.000.
Serizawa, Hiroyuki: *See*—
Fujita, Toshihiro; Ohya, Jun; Matsuda, Kenichi; and Serizawa, Hiroyuki, 4,899,360, Cl. 372-50.000.
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Seuter, Friedel: *See*—
Franckowiak, Gerhard; Bechem, Martin; Kayser, Michael; Gross, Rainer; Schramm, Matthias; Seuter, Friedel; Perzborn, Elisabeth; and Thomas, Gunther, 4,898,865, Cl. 514-252.000.
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S+G Implants GmbH: *See*—
Grundei, Hans, 4,898,161, Cl. 606-105.000.
SGS-Thomson Microelectronics, Inc.: *See*—
Cawlfield, Billy G., 4,898,835, Cl. 437-29.000.
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Nicollini, Germano, 4,899,069, Cl. 307-520.000.
Zambrano, Raffaele; and Musumeci, Salvatore, 4,898,836, Cl. 437-31.000.
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Gariboldi, Roberto, 4,899,098, Cl. 323-277.000.
Shaffer, John W., to GTE Products Corporation. Getter for incandescent lamps. 4,898,558, Cl. 445-53.000.
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Sharakan, Eric D.: *See*—
Potter, David; Provost, Laurence N.; Baron, John M.; Stefanovic, David; Sharakan, Eric D.; Sheppard, David A.; and Isman, Marshall A., 4,899,342, Cl. 371-10.100.
Sharp Kabushiki Kaisha: *See*—
Fujita, Yukitoshi, 4,899,192, Cl. 355-51.000.
Hayakawa, Toshiro; Suyama, Takahiro; Takahashi, Kohsei; Kondo, Masafumi; and Yamamoto, Saburo, 4,899,349, Cl. 372-44.000.
Iizuka, Taiji, 4,898,483, Cl. 400-61.000.
Ishimochi, Haruki; Yamamura, Kimio; Fukuyama, Yuji; Yanai, Masato; and Takahashi, Satoshi, 4,899,139, Cl. 340-721.000.
Matsumoto, Junichiro; Shimada, Mitsuhiro; and Yamamoto, Yoichi, 4,898,489, Cl. 400-656.000.
Yamada, Takeharu, 4,899,126, Cl. 338-309.000.
Yano, Seiki; and Hijikata, Toshiki, 4,899,359, Cl. 372-44.000.
Shaw, Henry: *See*—
Lewyllie, Dirk; Vangheluwe, Jose; Pauwels, Bernard; and Shaw, Henry, 4,898,214, Cl. 139-116.00A.
Shaw, Keith J.: *See*—
Keldany, Rachid; and Shaw, Keith J., 4,897,911, Cl. 29-429.000.
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Hutchison, Alan J.; Shaw, Kenneth R.; and Schneider, Josef A., 4,898,854, Cl. 514-89.000.
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Cohen, Joel B.; and Marhefka, Matthew, 4,898,300, Cl. 220-334.000.
Shell Oil Company: *See*—
Corley, Larry S., 4,898,999, Cl. 570-207.000.
Gergen, William P.; and Lutz, Robert G., 4,898,914, Cl. 525-314.000.
Sanders, Andrea; and Himes, Glenn R., 4,898,784, Cl. 428-412.000.
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Shembarger, Irene M.: *See*—
Ries, Stuart W.; and Shembarger, Irene M., 4,899,264, Cl. 362-92.000.
Sheppard, David A.: *See*—
Potter, David; Provost, Laurence N.; Baron, John M.; Stefanovic, David; Sharakan, Eric D.; Sheppard, David A.; and Isman, Marshall A., 4,899,342, Cl. 371-10.100.
Sherman Industries, Inc.: *See*—
Larson, Sherman L., 4,899,077, Cl. 312-325.000.
Sherritt, Jay G., to IDB Corporation. Taped data copying utilizing multiple addressable memories. 4,899,230, Cl. 360-15.000.
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Sherwood Medical Company: *See*—
Swisher, David R.; and DeWeese, F. Thane, 4,898,593, Cl. 604-319.000.
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Hashizume, Kenji; Ikebe, Masaru; Okamura, Masatoshi; and Shiba, Haruo, 4,899,242, Cl. 360-132.000.
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Numata, Koji; Asakura, Fumio; Kago, Yoshiyuki; Nozawa, Masaei; Shibakawa, Takahiro; Akado, Hajime; and Kato, Hideharu, 4,898,462, Cl. 356-70.000.
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Shibata, Hirotaka: *See*—
Fujita, Minoru; and Shibata, Hirotaka, 4,898,137, Cl. 123-352.000.
Shibata, Isamu; Asai, Takahiro; Nagasawa, Kiyoto; and Asada, Kenichirou, to Ricoh Co., Ltd. Semiconductor laser control apparatus. 4,899,344, Cl. 372-29.000.
Shibata, Nobuyuki: *See*—
Shiga, Syoji; Matsuda, Akira; Shibata, Nobuyuki; and Akasaka, Kiichi, 4,898,318, Cl. 228-183.000.
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Kiya, Yukitoshi; and Shimada, Kazuyuki, 4,899,348, Cl. 372-38.000.
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Matsumoto, Junichiro; Shimada, Mitsuhiro; and Yamamoto, Yoichi, 4,898,489, Cl. 400-656.000.
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Asada, Masanori; Hamaguchi, Shigeki; Katsuki, Hidetoshi; Nakamura, Yoshio; Takahashi, Hideyuki; Takahara, Kenji;

Shimada, Yoshio; Ohashi, Takehisa; and Watanabe, Kiyoshi, 4,898,822, Cl. 435-121.000.
Shimadzu Corporation: *See*—
Fukui, Isao; Hayashi, Shuzo; and Miyama, Takao, 4,898,466, Cl. 356-313.000.
Shimamoto, Takeshi: *See*—
Ikada, Yoshito; Suong, Hyu H.; Shimizu, Yoshihiko; Watanabe, Satoshi; Nakamura, Tatsuo; Suzuki, Masakazu; and Shimamoto, Takeshi, 4,898,186, Cl. 606-62.000.
Shimaya, Hiroshi: *See*—
Kaneko, Kiyotaka; Miyake, Izumi; Oda, Kazuya; Nakane, Yoshio; and Shimaya, Hiroshi, 4,899,212, Cl. 358-29.000.
Shimazaki, Osamu: *See*—
Tatsumi, Setsuji; Shiota, Kazuo; Urabe, Hitoshi; and Shimazaki, Osamu, 4,899,216, Cl. 358-80.000.
Shimazaki, Yoshihito: *See*—
Sato, Takuro; Shimazaki, Yoshihito; and Kawabe, Manabu, 4,899,148, Cl. 341-65.000.
Shimizu Construction Co., Ltd.: *See*—
Iizuka, Yunosuke; Ishii, Takashi; Mukawa, Yoshihiro; Nagata, Kouji; Matsumoto, Yoshitaka; and Murakami, Osamu, 4,899,277, Cl. 364-422.000.
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Shimizu, Kenjiro: *See*—
Kozoe, Katsutoshi; Furuya, Nobuo; Kimura, Shinichi; Okamoto, Yasunari; Kumada, Mitsuyoshi; Sugimoto, Tatsuo; Ueno, Takehiko; Shimizu, Kenjiro; and Itoh, Tsutomu, 4,898,116, Cl. 118-621.000.
Shimizu, Koji: *See*—
Hamada, Mitsuo; Shimizu, Koji; and Wakita, Haruki, 4,898,689, Cl. 252-510.000.
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Tsuchiyama, Yuji; and Shimizu, Masayuki, 4,898,230, Cl. 165-12.000.
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Ikada, Yoshito; Suong, Hyu H.; Shimizu, Yoshihiko; Watanabe, Satoshi; Nakamura, Tatsuo; Suzuki, Masakazu; and Shimamoto, Takeshi, 4,898,186, Cl. 606-62.000.
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Kishita, Hirofumi; Yamaguchi, Koichi; and Yoshida, Akira, 4,898,958, Cl. 556-448.000.
Ogihara, Masahiro; Makikawa, Shinji; and Iguchi, Masaaki, 4,898,641, Cl. 156-601.000.
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Okuda, Hironori; and Matsubara, Takashi, 4,899,145, Cl. 341-15.000.
Shinano Kenshi Kabushiki Kaisha: *See*—
Hasebe, Yoichi, 4,899,075, Cl. 310-257.000.
Shine, Jerry P. Releasable mount for window grilles. 4,897,961, Cl. 49-141.000.
Shingaki, Kouichi: *See*—
Kitano, Hirohisa; Saito, Itaru; Matsubara, Ken; Shingaki, Kouichi; and Masuda, Tomohiko, 4,899,183, Cl. 346-154.000.
Shinkevich, Alex: *See*—
Hodgkins, David H.; and Shinkevich, Alex, 4,898,668, Cl. 210-180.000.
Shintai, Akira: *See*—
Shibata, Hiroshi; Maehara, Fuyuki; Shintai, Akira; and Kato, Hidetoshi, 4,899,209, Cl. 357-74.000.
Shiota, Eiji: *See*—
Arai, Akihiko; Okada, Kazuichi; Kamo, Tetsuo; and Shiota, Eiji, 4,899,028, Cl. 219-10.493.
Shiota, Kazuo: *See*—
Tatsumi, Setsuji; Shiota, Kazuo; Urabe, Hitoshi; and Shimazaki, Osamu, 4,899,216, Cl. 358-80.000.
Shioya, Masaharu: *See*—
Sano, Teruo; and Shioya, Masaharu, 4,899,228, Cl. 358-473.000.
Shippers Paper Products Company: *See*—
Linnemann, Kent A., 4,898,279, Cl. 206-586.000.
Shir, Ching-Cheng: *See*—
Yamashita, Tsutomu T.; Shir, Ching-Cheng; Chen, Tu; and Chen, Ga-Lane, 4,898,774, Cl. 428-336.000.
Shirahata, Akihiko: *See*—
Yoshitake, Makoto; Yamane, Shinichiro; and Shirahata, Akihiko, 4,898,959, Cl. 556-466.000.
Shiraki, Hiroyuki, to Takeda Chemical Industries, Ltd. Urethane resins. 4,898,922, Cl. 528-60.000.
Shishido, Yoshio: *See*—
Uchiyama, Naoki; Shishido, Yoshio; and Ueda, Yasuhiro, 4,898,574, Cl. 604-22.000.
Shiwa, Shinichi: *See*—
Ooba, Yuji; Sugihara, Shigeo; Masumori, Tadaaki; and Shiwa, Shinichi, 4,899,224, Cl. 358-332.000.
Shoen, Jerry W.; and Margerum, David E., to Armco Advanced Materials Corporation. Ultra-rapid heat treatment of grain oriented electrical steel. 4,898,626, Cl. 148-111.000.
Shoketsu Kinzohu Kogyo Kabushiki Kaisha: *See*—
Odajima, Katsuhiko; and Ikehata, Motoshige, 4,898,200, Cl. 137-85.000.
Shook, Raymond J.: *See*—
Davis, David R.; Slayton, Danny L.; and Shook, Raymond J., 4,899,197, Cl. 355-290.000.
Shore Plastics, Inc.: *See*—
Sussman, Morris, 4,898,195, Cl. 132-317.000.
Showa Denko K.K.: *See*—
Onouchi, Takashi; Sugai, Hironori; Sekiguchi, Kazuo; Hosoda, Yoshikazu; and Yoshida, Eiichi, 4,898,781, Cl. 428-402.220.
Showa Denko Kabushiki Kaisha: *See*—
Hitoshio, Akio; Takamatsu, Hisao; and Hattori, Reiko, 4,898,820, Cl. 435-95.000.
Shrikhande, Anil J.; and Alioto, Joseph A., to Heublein, Inc. Process for the decharacterization of base wine. 4,898,742, Cl. 426-271.000.
Shroot, Braham: *See*—
Lang, Gerard; Forestier, Serge; Lagrange, Alain; and Shroot, Braham, 4,898,883, Cl. 514-544.000.
Shu-Hwa, Lee. Bicycle brake light control switch assembly. 4,899,023, Cl. 200-61.120.
Shu, Paul: *See*—
Jenninga, Alfred R., Jr.; and Shu, Paul, 4,898,242, Cl. 166-285.000.
Shuker, Brian; and Huggett, Richard D. J., to Lewmar Marine Limited. Two-speed winch. 4,898,364, Cl. 254-342.000.
Shur, Michael; and Simmons, John G., to University of Minnesota, Regents of the. Novel high-speed integrated heterostructure transistors, photodetectors, and optoelectronic circuits. 4,899,200, Cl. 357-30.000.
Shur, Michael: *See*—
Xu, Jingming; Shur, Michael; and Sweeny, Mark, 4,899,201, Cl. 357-22.000.
Shutterly, Harold B.: *See*—
Einolf, Charles W., Jr.; Shutterly, Harold B.; Sun, Shan C.; Gonnam, Russel W.; Ray, Roger E.; Koch, Karl C.; and Maynard-Nenno, Pamela M., 4,899,383, Cl. 380-48.000.
Siecor Corporation: *See*—
Story, Christopher A., 4,898,451, Cl. 350-96.230.
Siegel, Seymour; and Maggio, Louis. Method and apparatus for obtaining ozone saturated water. 4,898,679, Cl. 210-752.000.
Siemens Aktiengesellschaft: *See*—
Baur, Hans; and Bittermann, Hans, 4,899,336, Cl. 370-63.000.
Birzer, Josef, 4,899,252, Cl. 361-350.000.
Hosten, Daniel, 4,898,657, Cl. 204-198.000.
Kuhlmann, Werner, 4,898,447, Cl. 350-96.200.
Lischke, Burkhard, 4,899,060, Cl. 250-505.100.
Schwarzl, Helmut; and Unterlass, Josef, 4,899,032, Cl. 219-375.000.
Vaclavik, Peter, 4,899,379, Cl. 379-377.000.
Van Landeghem, Marc, 4,899,374, Cl. 379-215.000.
Siemens Energy & Automation, Inc.: *See*—
Buxton, Clifford A., 4,899,253, Cl. 361-376.000.
Leone, David A.; Moody, G. Lawrence; Holland, William D.; Bell, Mark E.; and Robbins, W. Dale, 4,899,022, Cl. 200-50.00A.
Siemens Transmission Systems, Inc.: *See*—
Gartner, Todd H., 4,899,382, Cl. 379-413.000.
Siepmann, Friedrich W.; and Teutscher, Michael. Apparatus for the detection of biodegradable and toxic substances in aqueous solutions. 4,898,829, Cl. 435-289.000.
Siffert, Odile: *See*—
Dodin, Andre; Siffert, Odile; Le Thuillier, Georgette; and Allard, Patrice, 4,898,815, Cl. 435-7.000.
Signal One Corporation: *See*—
Roehrs, Don P.; and Granberg, Helge O., 4,899,116, Cl. 330-251.000.
Simasaki, Shuhei: *See*—
Yoshimura, Tatsushiro; Tomihashi, Nobuyuki; and Simasaki, Shuhei, 4,898,779, Cl. 428-402.000.
Simmons, Carver S.: *See*—
Cry, John W.; Kirkham, Randy R.; McBride, John F.; Simmons, Carver S.; and Gee, Glendon W., 4,899,047, Cl. 250-227.000.
Simmons, John G.: *See*—
Shur, Michael; and Simmons, John G., 4,899,200, Cl. 357-30.000.
Simmons, Thomas E., to Morgan Construction Company. Roll neck bearing assembly and inner bearing component therefor. 4,898,479, Cl. 384-130.000.
Simo, Miroslav A. Arrow rest and holder. 4,898,145, Cl. 124-41.00A.
Simoji, Yasuo: *See*—
Morisawa, Yasuhiro; Kataoka, Mitsuru; Sugiyama, Mitsuo; Saito, Fujio; Koike, Hiroyuki; Oshima, Takeshi; Simoji, Yasuo; and Nagahori, Hitoshi, 4,898,862, Cl. 514-236.200.
Simon, Jaime; Wilson, David A.; Volkert, Wynn A.; Troutner, David E.; and Goeckeler, William F., to Dow Chemical Company, The. Organis amine phosphonic acid complexes for the treatment of calcific tumors. 4,898,724, Cl. 424-1.100.
Simplicity Manufacturing, Inc.: *See*—
Klas, Kenneth H.; and Brown, Richard R., 4,897,942, Cl. 37-244.000.
Simpson, Jeff A.: *See*—
Thorne, Glenn A.; Joy, Robert D.; and Simpson, Jeff A., 4,898,464, Cl. 356-152.000.
Simpson Strong-Tie Company, Inc.: *See*—
Colonias, Karen W., 4,897,979, Cl. 52-643.000.
Sims, Darrell E.: *See*—
Agius, Frank P.; and Sims, Darrell E., 4,898,504, Cl. 409-81.000.
Sindelar, Pavel: *See*—
Salajka, Zdenek; Hamrik, Odlrich; Kratochvila, Jan; Gheorghiu, Mihnea; Krivanek, Josef; Sindelar, Pavel; Zaloudik, Petr; Legeza, Vasil; and Jansa, Ladislav, 4,898,847, Cl. 522-110.000.
Singh, Laxman: *See*—
Rice, Wayne K.; and Singh, Laxman, 4,898,673, Cl. 210-634.000.
Singh, Prabhakar; Ruka, Roswell J.; and George, Raymond A., to Westinghouse Electric Corp. Electrochemical generator apparatus

containing modified high temperature insulation and coated surfaces for use with hydrocarbon fuels. 4,898,792, Cl. 429-19.000.

Sinykin, William B., to Logan Manufacturing Company. Snow grooming comb. 4,897,941, Cl. 37-222.000.

Siol, Werner; and Terbrack, Ulrich, to Rohm GmbH Chemische Fabrik. Compatible polymer blends. 4,898,912, Cl. 525-199.000.

Sipinen, Alan J.: *See*—
Brown, Josephine S.; and Sipinen, Alan J., 4,898,762, Cl. 428-152.000.

Sipra Patententwicklungs-Und Beteiligungsgesellschaft: *See*—
Brunner, Heinz; and Sauter, Karl-Jurgen, 4,898,337, Cl. 242-151.000.

Sireci, Donald J. Utility routing system for modular panels. 4,899,018, Cl. 174-48.000.

Sirota, Vladimir. Device for detecting, monitoring, displaying and recording of material and fetal vital signs and permitting communication between a woman and her fetus. 4,898,179, Cl. 128-670.000.

Sit, Sing-Yuen: *See*—
Wright, John J.; Sit, Sing-Yuen; Balasubramanian, Neelakantan; and Brown, Peter J., 4,898,949, Cl. 548-253.000.

Sitnik, Eran: *See*—
Hawkins, Brian; Greenberg, Jerald; Alon, Ofer; Marten, Victor; Banyai, Edward; Edwards, Jennifer A.; Banyai, David M.; Sanchez, Juan C.; Sitnik, Eran; and Yozzo, Joseph A., 4,898,182, Cl. 128-707.000.

Sjoberg, Berndt O. H.: *See*—
Bamberg, Peter; Ekstrom, Bertil A.; Forsgren, Ulf E.; and Sjoberg, Berndt O. H., 4,898,731, Cl. 424-114.000.

Skarhamn International AB: *See*—
Heide, Jan B., 4,898,741, Cl. 426-231.000.

SKC Limited: *See*—
Ko, Jae K.; and Chung, Kyung H., 4,898,277, Cl. 206-387.000.

SKF (UK) Limited: *See*—
Hamblin, Ronald F., 4,898,481, Cl. 384-581.000.

Skrtic, Tom; and Juntunen, Timothy J., to Minnesota Mining and Manufacturing Company. Non nesting component carrier tape. 4,898,275, Cl. 206-330.000.

Skurkovich, Boris; and Skurkovich, Simon. Male and female condoms for the prevention of the transmission of AIDS and other venereal deseases. 4,898,184, Cl. 128-844.000.

Skurkovich, Simon: *See*—
Skurkovich, Boris; and Skurkovich, Simon, 4,898,184, Cl. 128-844.000.

Slack, William E., to Mobay Corporation. Liquid isocyanate prepolymers. 4,898,971, Cl. 560-359.000.

Slade, Frank A.: *See*—
Luebke, Clement J.; Slade, Frank A.; Sank, Gerald W.; Grob, James T.; Price, George M.; and Hubbard, Elbert M., 4,898,151, Cl. 126-391.000.

Slasinski, Arthur L., to Weldex, Inc. Method and apparatus for forming joints. 4,897,912, Cl. 29-432.200.

Slayton, Danny L.: *See*—
Davis, David R.; Slayton, Danny L.; and Shook, Raymond J., 4,899,197, Cl. 355-290.000.

Sleegers, Franciscus T.; Schuitmaker, Pieter D.; and Janssen, Peter J. M., to U.S. Philips Corporation. Optically readable disc with a centering member fixed to a transparent substrate. 4,899,329, Cl. 369-275.000.

Sliwka, Wolfgang, to BASF Aktiengesellschaft. Continuous preparation of microcapsules with melamine-formaldehyde condensate walls in aqueous dispersion 4,898,696, Cl. 264-4.700.

Smart House Limited Partnership: *See*—
MacFadyen, David J.; Edwards, Robert G.; Wacks, Kenneth P.; and Foley, Daniel J., 4,899,129, Cl. 340-310.00R.
MacFadyen, David J.; Edwards, Robert G.; Wacks, Kenneth P.; and Foley, Daniel J., 4,899,217, Cl. 358-86.000.

SMH Alcatel: *See*—
Gregoire, Jean-Pierre, 4,898,313, Cl. 226-197.000.

Smith, Christopher D.: *See*—
Berson, William; Gluck, Julius; Murphy, Patrick; Smith, Christopher D.; and Tran, Duc H., 4,899,172, Cl. 346-76.0PH.

Smith, David N.: *See*—
Atkinson, Alan W.; and Smith, David N., 4,898,701, Cl. 264-109.000.

Smith, Franklin S.: *See*—
Kopiec, Lawrence J.; and Smith, Franklin S., 4,897,907, Cl. 29-888.400.

Smith, Michael P., to Amoco Corporation. Method and apparatus for analyzing fluid inclusions. 4,898,831, Cl. 436-32.000.

Smith, Robert S. Segmented disk clamp. 4,898,397, Cl. 279-4.000.

Smiths Industries Public Limited Company: *See*—
Yule, Bruce, 4,898,168, Cl. 128-207.150.

Smyth, Robert R.: *See*—
Cote, William F.; and Smyth, Robert R., 4,899,279, Cl. 364-424.050.

Snap-on Tools Corporation: *See*—
Butzen, James K., 4,898,524, Cl. 418-136.000.

Snelgrove, R. Vernon: *See*—
McCullough, Francis P., Jr.; Hotchkiss, Robert L.; Snelgrove, R. Vernon; Hall, David M.; and McCullough, Jacqueline R., 4,898,783, Cl. 428-408.000.

Snell, Kenneth D.: *See*—
Bammel, Brian D.; Wieczerniak, Walter J.; and Snell, Kenneth D., 4,898,652, Cl. 204-44.200.

So, Hock-Chuen; and Wong, Sau-Ching, to Altera Corporation. Programmable logic devices with spare circuits for use in replacing defective circuits. 4,899,067, Cl. 307-465.000.

Societe Anonyme: Poclain Hydraulics, B.P.: *See*—
Bigo, Louis; and Allart, Bernard, 4,898,076, Cl. 91-491.000.

Societe de Conseils et D'Etudes Des Emballages S.C.E.E.: *See*—
Morel, Simone, 4,898,293, Cl. 215-250.000.

Societe de Prospection et D'Inventions Techniques (S.P.I.T.): *See*—
Vernerey, Jean-Claude, 4,898,315, Cl. 227-10.000.

Societe Nationale Elf Aquitaine: *See*—
Gauthier, Michel; and Belanger, Andre, 4,897,917, Cl. 29-623.300.

Societe Nouvelle d'Exploitation La Calhene: *See*—
Picard, Claude, 4,898,713, Cl. 422-3.000.

Soda Aromatic Company, Limited: *See*—
Ito, Nobuhiko; Kinoshita, Kimio; Suzuki, Kiyonori; and Eto, Takeaki, 4,898,985, Cl. 568-344.000.

Sogo Pharmaceutical Company Limited: *See*—
Narutomi, Yuji; Katsumata, Manabu; Osawa, Yasuko; and Uchikuga, Saburo, 4,898,870, Cl. 514-292.000.

Sokkisha Co., Ltd.: *See*—
Kawachi, Hideya; and Chiba, Minoru, 4,898,452, Cl. 350-97.000.

Solanki, J. J., to Mobil Oil Corporation. Method and apparatus for determining the source signature of land vibrators. 4,899,321, Cl. 367-48.000.

Solvay & Cie: *See*—
Hannecart, Etienne, 4,898,906, Cl. 524-406.000.

Somar Corporation: *See*—
Sumi, Sigeo, 4,898,376, Cl. 271-272.000.

Sommer, Friedrich-Wilhelm, to ABB CEAG Licht- und Stromversorgungstechnik GmbH. Transformer, choke and the like. 4,899,122, Cl. 336-65.000.

Sonex Research, Inc.: *See*—
Failla, Charles C.; Pouring, Andrew A.; Rankin, Bruce; di Priolo, Carlo L.; McCowan, William; and Gosewisch, Dennis, 4,898,135, Cl. 123-263.000.

Sony Corporation: *See*—
Odaka, Kentaro; Ozaki, Shinya; Yamada, Masaki; Ishibashi, Hiroshi; and Inazawa, Yoshizumi, 4,899,232, Cl. 360-48.000.
Tamada, Hitoshi; Kaneko, Masahiko; and Okamoto, Tsutomu, 4,898,440, Cl. 350-96.130.

Sood, Lal C.: *See*—
Hoekstra, George P.; Sood, Lal C.; and Alexander, Samuel E., 4,899,317, Cl. 365-203.000.

Soto, Jorge L.: *See*—
Avidan, Amos A.; Johnson, David L.; and Soto, Jorge L., 4,899,014, Cl. 585-533.000.

Sotoyama, Kaoru: *See*—
Nishimura, Eiji; Nobumoto, Kazutoshi; Matsuoka, Toshihiro; Tsuyama, Toshiaki; and Sotoyama, Kaoru, 4,898,138, Cl. 123-399.000.

Spaeth, Edmund E.: *See*—
Borsanyi, Alexander S.; Redmond, Russell J.; Vidal, Claude A.; and Spaeth, Edmund E., 4,898,584, Cl. 604-153.000.

Spalla, Pier L. Multipurpose and self-moving agricultural machine. 4,897,987, Cl. 56-16.700.

Spaltenstein, Andreas: *See*—
Shapiro, Bennett M.; Turner, Eric E.; Hopkins, Paul B.; Klevit, Rachel E.; Holler, Tod P.; and Spaltenstein, Andreas, 4,898,878, Cl. 514-386.000.

Span Instruments, Inc.: *See*—
Gray, Tommy L., 4,898,036, Cl. 73-861.740.

Spanke, Ronald A.: *See*—
Johnson, James M., Jr.; and Spanke, Ronald A., 4,899,335, Cl. 370-60.000.

Spark, Dieter: *See*—
Ernst, Alfons; and Spark, Dieter, 4,897,929, Cl. 33-559.000.

Spector, George: *See*—
Farrelly, Susan E.; and Spector, George, 4,898,180, Cl. 128-681.000.
Lind, Robert C., Sr.; and Spector, George, 4,898,418, Cl. 296-181.000.

Spector, Sydney: *See*—
Morgan, James I.; Spector, Sydney; and Wang, James K. T., 4,898,861, Cl. 514-221.000.

Spectranetics Corporation, The: *See*—
Murray, Gordon A.; Golobic, Robert A.; and Derrickson, Stephan G., 4,899,363, Cl. 372-65.000.

Speicher, Edwin W., to M. E. Cunningham Company. Method and apparatus for marking on an arcuate surface. 4,898,485, Cl. 400-121.000.

Sperry, Lawrence B.; and Ruddy, Henry J., to Sealed Air Corporation. Injection system for foamable compositions. 4,898,327, Cl. 239-1.000.

Spielberger, Richard K.: *See*—
Dunaway, Thomas J.; Spielberger, Richard K.; and Dicks, Lori A., 4,898,320, Cl. 228-245.000.

Spirk, John: *See*—
Nottingham, John R.; and Spirk, John, 4,898,561, Cl. 446-220.000.

Spofa, spojene podniky pro: *See*—
Kasafirek, Evzen; Rybak, Miroslav; Krejci, Ivan; Sturc, Antonin; Roubalova, Alena; Vanzura, Jiri ; Krepela, Evzen; and Bartik, Michal, 4,898,930, Cl. 530-332.000.

Sprague Electric Company: *See*—
Gouvernelle, Didier, 4,899,258, Cl. 361-534.000.
Maher, Galeb H.; and Stefanik,. Susan E., 4,898,844, Cl. 501-138.000.

Sprengart, Mathias: *See*—
Schrammek, Manfred F. L.; and Sprengart, Mathias, 4,899,260, Cl. 362-32.000.

Springer, Hartmut: *See*—
Schlafer, Ludwig; Springer, Hartmut; and Hahnle, Reinhard, 4,898,933, Cl. 534-605.000.
Schwaiger, Gunther; Springer, Hartmut; and Helmling, Walter, 4,898,944, Cl. 544-337.000.
Springer, Johann; and Heck, Wolfgang, to Alcatel N.V. Electrode array for an electrooptical facsimile recorder and method of controlling said electrode array. 4,899,223, Cl. 358-302.000.
Springfield, Hendrix W. Earth scraper attachment for a tractor or the like. 4,898,247, Cl. 172-799.500.
Spronken, John R. Form-work for concrete. 4,898,358, Cl. 249-7.000.
Square D Company: *See*—
Newell, Edwin R.; and Franks, Terry E., 4,898,445, Cl. 350-96.200.
Stadler, Fred, to International Business Machines Corporation. Field-directed screen help technique. 4,899,276, Cl. 364-300.000.
Staheli, Paul, to Rieter Machine Works, Ltd. Clothing for a cleaning or opening roller. 4,897,897, Cl. 19-114.000.
Stahler, Fritz: *See*—
Klose, Sigmar; and Stahler, Fritz, 4,898,832, Cl. 436-45.000.
Stamatoff, James B.: *See*—
Buckley, Alan; Che, Tessie M.; Leslie, Thomas M.; Stamatoff, James B.; Stuetz, Dagobert E.; and Ulrich, Donald R., 4,898,454, Cl. 350-350.00R.
Stammers, Anthea T.: *See*—
Levy, Julia G.; Steele, J. Kevin; and Stammers, Anthea T., 4,898,730, Cl. 424-88.000.
Stanadyne Automotive Corp.: *See*—
Hodgkins, David H.; and Shinkevich, Alex, 4,898,668, Cl. 210-180.000.
Kopiec, Lawrence J.; and Smith, Franklin S., 4,897,907, Cl. 29-888.400.
Standard Microsystems Corporation: *See*—
Morales, Lou, 4,899,071, Cl. 307-605.000.
Standard Register Company, The: *See*—
Seitz, Michael E. A., 4,898,780, Cl. 428-402.210.
Stankowiak, Achim; and Schulz, Hildegard, to Hoechst AG. Process for the preparation of alkylene glycol dialkyl ethers. 4,898,992, Cl. 568-618.000.
Stapensea, Jan A., to Fasto B.V. Heating appliance. 4,898,146, Cl. 126-116.00A.
Stark, Klaus: *See*—
Asdollahi, Norbert; Poerschke, Karl; Stark, Klaus; and Friedrich, Claus, 4,899,123, Cl. 337-273.000.
Starlinger-Huemer, Franz X. Process for the manufacture of a tubular semimanufactured article made from plastic for the fabrication of container sacks. 4,898,637, Cl. 156-172.000.
Statpower Technologies Corp.: *See*—
Bond, Eric D., 4,899,270, Cl. 363-56.000.
Stauffer, John E. Production of allyl chloride. 4,899,000, Cl. 570-222.000.
STC PLC: *See*—
Epworth, Richard E.; Wright, Stephen; and Bricheno, Terry, 4,898,443, Cl. 350-96.150.
Scanlan, Ian F.; and Robinson, Alan, 4,898,442, Cl. 350-96.150.
Stearns, Charles F.: *See*—
Perkinson, Robert H.; Stearns, Charles F.; and Belanger, Rene F., 4,898,324, Cl. 236-92.00R.
Steele, J. Kevin: *See*—
Levy, Julia G.; Steele, J. Kevin; and Stammers, Anthea T., 4,898,730, Cl. 424-88.000.
Stefanik, Susan E.: *See*—
Maher, Caleb H.; and Stefanik, Susan E., 4,898,844, Cl. 501-138.000.
Stefanovic, David: *See*—
Potter, David; Provost, Laurence N.; Baron, John M.; Stefanovic, David; Sharakan, Eric D.; Sheppard, David A.; and Isman, Marshall A., 4,899,342, Cl. 371-10.100.
Stegemoeller, Calvin L.; and Walker, Lonnie R., to Halliburton Company. Blended system with concentrator. 4,898,473, Cl. 366-132.000.
Stegman, Todd R.: *See*—
Fitzgerald, Thomas H.; Razzano, John S.; and Stegman, Todd R., 4,898,898, Cl. 523-351.000.
Steinbach, Gary R.: *See*—
Beard, Marian H.; Caro, Perry A.; Hsiao, Jennifer B.; Mackey, Kevin J.; Sandman, James G., Jr.; Steinbach, Gary R.; and Woods, Donald R., 4,899,136, Cl. 340-706.000.
Steiner, Antony F.: *See*—
McCriadle, John A.; Steiner, Antony F.; and Jackson, Andrew M., 4,899,036, Cl. 235-380.000.
Steinway, Steven. Shelf support for glass shelving. 4,898,355, Cl. 248-235.000.
Stemcor Corporation, The: *See*—
Cooper, Paul V., 4,898,367, Cl. 266-216.000.
Stendel, Wilhelm: *See*—
Buchel, Karl H.; Holmwood, Graham; Kraatz, Udo; Kramer, Wolfgang; Reinecke, Paul; Brandes, Wilhelm; and Stendel, Wilhelm, 4,898,875, Cl. 514-383.000.
Sterling Drug Inc.: *See*—
Bailey, Denis M.; Lesher, George Y.; and D'Ambra, Thomas E., 4,898,880, Cl. 514-406.000.
Stern, Ronald D.: *See*—
Jungkman, David L.; Comey, David M.; Stern, Ronald D.; and Musicant, Bruce L., 4,898,435, Cl. 350-1.100.
Stewart, John S., to Brush Switchgear Limited. Auto recloser coil burn-out protection. 4,899,247, Cl. 361-72.000.
Stewart, Matthew M. Replaceable shim. 4,898,482, Cl. 384-626.000.
Stiff, Omar L.: *See*—
Miller, William D.; Stiff, Omar L.; and Mercurio, Benardo, 4,897,910, Cl. 29-426.300.
Stilwell, Charles T.: *See*—
Bellew, Roy G.; Dunn, Donald P.; Stilwell, Charles T.; and Wood, Johnny D., 4,898,106, Cl. 110-346.000.
Stirling Thermal Motors, Inc.: *See*—
Meijer, Roelf J.; and Verhey, Robert P., 4,897,997, Cl. 60-517.000.
Stobbe, Anatoli; and Herrmann, Wilfried, to Stobbe, Anatoli. Motion sensor. 4,899,132, Cl. 340-551.000.
Stocchiero, Olimpio. Lid for lead-acid accumulators with elastic and deformable pole seats. 4,898,795, Cl. 429-66.000.
Stollery, David J. Observation tower. 4,897,972, Cl. 52-94.000.
Stordy Combustion Engineering Limited: *See*—
Wills, Brian; and Johns, Gary, 4,898,530, Cl. 431-11.000.
Stormberg, Hans-Peter; and Watanabe, Yoshio, to U.S. Philips Corporation; and Hitachi Ltd. X-ray lithography system. 4,899,355, Cl. 378-34.000.
Story, Christopher A., to Siecor Corporation. Wax encased fiber optic cable. 4,898,451, Cl. 350-96.230.
Stotz, Wolf-Gunter: *See*—
Weisshuhn, Elmer; Bubik, Alfred; Dahl, Hans; Holik, Herbert; Kurtz, Rudiger; Zembrot, Anton; Stotz, Wolf-Gunter; Seider, Werner; and Trondle, Robert, 4,898,643, Cl. 162-259.000.
Stout, Darwin E.; Wilcox, Robert C.; and Peloquin, Charles A., to Trojan Luggage Company, The. Doubled hanging garment bag. 4,898,274, Cl. 206-289.000.
Strege, Timothy A.: *See*—
Altnether, Paul J.; and Strege, Timothy A., 4,897,926, Cl. 33-203.140.
Stricharczuk, Paul T.: *See*—
Lane, Parley C.; Tenney, Linwood P.; Benedikt, George M.; and Stricharczuk, Paul T., 4,899,005, Cl. 585-360.000.
Stroh, Richard D., to International Business Machines Corporation. Method and apparatus for stitcher wire loading. 4,898,314, Cl. 227-3.000.
Struthers, Keith D.: *See*—
Bender, James G.; Herron, Lee F.; and Struthers, Keith D., 4,898,361, Cl. 251-129.050.
Struve, Alfred: *See*—
Hoeffkes, Horst; Seidel, Kurt; Giede, Karl; Struve, Alfred; and Gruber, Bert, 4,898,725, Cl. 424-70.000.
Stuetz, Dagobert E.: *See*—
Borzo, Marie; and Stuetz, Dagobert E., 4,898,691, Cl. 252-589.000.
Buckley, Alan; Che, Tessie M.; Leslie, Thomas M.; Stamatoff, James B.; Stuetz, Dagobert E.; and Ulrich, Donald R., 4,898,454, Cl. 350-350.00R.
Che, Tessie M.; Stuetz, Dagobert E.; Buckley, Alan; and Ulrich, Donald R., 4,898,755, Cl. 427-389.700.
Sturc, Antonin: *See*—
Kasafirek, Evzen; Rybak, Miroslav; Krejci, Ivan; Sturc, Antonin; Roubalova, Alena; Vanzura, Jiri ; Krepela, Evzen; and Bartik, Michal, 4,898,930, Cl. 530-332.000.
Su, Lih-Chuan. Coin slot structure for coin call telephone apparatus. 4,899,371, Cl. 379-146.000.
Subramaniam, Anandaraman; Ozogar, Robert M.; and Bergsbaken, Carlton K., to Borden, Inc. Process for preparing "non-bitter" enzyme modified cheese flavoring material and spray dried product. 4,898,739, Cl. 426-35.000.
Suchomel, Frank H.: *See*—
Granberg, Dirk N.; Suchomel, Frank H.; and Ryno, Robert W., 4,898,124, Cl. 122-382.000.
Suck, Yoon-Gi. Power window switch for an automobile. 4,899,063, Cl. 307-9.100.
Sudo, Kimio: *See*—
Fujii, Setsuro; Ishikawa, Hiroshi; Yasumura, Koichi; Jitsukawa, Koichiro; Toyama, Sachio; Tsubouchi, Hidetsugu; Sudo, Kimio; and Tsuji, Kouichi, 4,898,859, Cl. 514-210.000.
Suehiro, Misayo: *See*—
Yamamoto, Naoki; Mori, Hiroshi; Nakata, Akira; and Suehiro, Misayo, 4,898,918, Cl. 525-425.000.
Sugai, Hironori: *See*—
Onouchi, Takashi; Sugai, Hironori; Sekiguchi, Kazuo; Hosoda, Yoshikazu; and Yoshida, Eiichi, 4,898,781, Cl. 428-402.220.
Sugata, Masao; Den, Tohru; Ito, Susumu; Hirabayashi, Keiji; Ikoma, Keiko; Kurihara, Noriko; Osabe, Kuniji; Takeuchi, Tatsuo; Satomura, Hiroshi; Oguchi, Yoshihiro; Maruyama, Akio; and Saito, Keishi, to Canon Kabushiki Kaisha. Photosensitive member having a light receiving layer comprising a carbonic film for use in electrophotography. 4,898,798, Cl. 430-58.000.
Sugawara, Kazuhiro: *See*—
Morita, Hideki; Sugawara, Kazuhiro; Hung, Po-Chieh; Hara, Hirotaka; Nakamura, Tadashi; Kobayashi, Kazuyuki; Azuma, Masashi; and Katsuta, Tsuyoshi, 4,899,215, Cl. 358-78.000.
Sugihara, Shigeo: *See*—
Ooba, Yuji; Sugihara, Shigeo; Masumori, Tadaaki; and Shiwa, Shinichi, 4,899,224, Cl. 358-332.000.
Sugimoto, Tatsuo: *See*—
Kozoe, Katsutoshi; Furuya, Nobuo; Kimura, Shinichi; Okamoto, Yasunari; Kumada, Mitsuyoshi; Sugimoto, Tatsuo; Ueno, Takehiko; Shimizu, Kenjiro; and Itoh, Tsutomu, 4,898,116, Cl. 118-621.000.
Sugino, Takuya: *See*—
Fujimoto, Sachito; and Sugino, Takuya, 4,898,143, Cl. 123-571.000.

Sugita, Akio: *See*—
Tamamura, Toshiaki; Katsuta; Niwa, Osamu; Hikita, Makoto; and Sugita, Akio, 4,898,766, Cl. 428-195.000.
Sugiyama, Mitsuo: *See*—
Morisawa, Yasuhiro; Kataoka, Mitsuru; Sugiyama, Mitsuo; Saito, Fujio; Koike, Hiroyuki; Oshima, Takeshi; Simoji, Yasuo; and Nagahori, Hitoshi, 4,898,862, Cl. 514-236.200.
Sulzer-Escher Wyss GmbH: *See*—
Weisshuhn, Elmer; Bubik, Alfred; Dahl, Hans; Holik, Herbert; Kurtz, Rudiger; Zembrot, Anton; Stotz, Wolf-Gunter; Seider, Werner; and Trondle, Robert, 4,898,643, Cl. 162-259.000.
Sumi, Sigeo, to Somar Corporation. Film conveying apparatus. 4,898,376, Cl. 271-272.000.
Sumitomo Chemical Company, Limited: *See*—
Haga, Toru; Nagano, Eiki; Morita, Kouichi; and Sato, Ryo, 4,898,948, Cl. 548-171.000.
Suzukamo, Gohfu; Sakito, Yoji; Fukao, Masami; and Hagiya, Koji, 4,898,655, Cl. 204-157.870.
Sumitomo Electric Industries, Ltd.: *See*—
Kohno, Teruhisa; Hashida, Koichi; and Takata, Koji, 4,898,434, Cl. 303-119.000.
Nakamura, Naohiro; Mori, Yoshikatsu; and Honda, Keiji, 4,898,500, Cl. 407-62.000.
Sumitomo Heavy Industries, Ltd.: *See*—
Ogata, Seishiro; and Taki, Katsumi, 4,898,065, Cl. 475-179.000.
Sumitomo Special Metals Co. Ltd.: *See*—
Ishigaki, Naoyuki; Hamada, Takaki; and Fujimura, Setsuo, 4,898,613, Cl. 75-251.000.
Summa, Gareth D., to Mid-West Conveyor Co., Inc. Positive retraction trolley stop for power and free conveyors. 4,898,099, Cl. 104-172.400.
Sun Refining and Marketing Company: *See*—
Ellis, Paul E., Jr.; and Lyons, James E., 4,898,989, Cl. 568-399.000.
Sun, Shan C.: *See*—
Einolf, Charles W., Jr.; Shutterly, Harold B.; Sun, Shan C.; Gonnam, Russel W.; Ray, Roger E.; Koch, Karl C.; and Maynard-Nenno, Pamela M., 4,899,383, Cl. 380-48.000.
Sundsrud, Larry A.: *See*—
Rose, Robert J.; and Sundsrud, Larry A., 4,898,166, Cl. 128-205.130.
Sundstrand Corporation: *See*—
Metcalf, Jeffrey D., 4,898,265, Cl. 192-8.00R.
Shekleton, Jack R., 4,897,994, Cl. 60-39.060.
Sunshon Molding Co., Ltd.: *See*—
Wang, Kai-San, 4,897,895, Cl. 16-20.000.
Sunstar Giken Kabushiki Kaisha: *See*—
Ueda, Ryuichi; Mori, Masahito; and Torii, Kohske, 4,898,919, Cl. 525-440.000.
Suntec Industries Incorporated: *See*—
Harwath, Frank L., 4,898,523, Cl. 418-70.000.
Sunwa Sharyo Manufacturing Co., Ltd.: *See*—
Lehner, Max, 4,898,256, Cl. 180-8.200.
Suong, Hyu H.: *See*—
Ikada, Yoshito; Suong, Hyu H.; Shimizu, Yoshihiko; Watanabe, Satoshi; Nakamura, Tatsuo; Suzuki, Masakazu; and Shimamoto, Takeshi, 4,898,186, Cl. 606-62.000.
Superior Granite & Marble Restoration: *See*—
Zapata, Manuel, 4,898,598, Cl. 51-309.000.
Surgin Surgical Instrumentation, Inc.: *See*—
Worthrich, Theodore S., 4,898,162, Cl. 128-155.000.
Surles, Billy W.: *See*—
Friedman, Robert H.; and Surles, Billy W., 4,898,750, Cl. 427-221.000.
Surugue nee Lasnier, Evelyne; Lasnier, Hubert; and Perovitch, Philipe, to Futur-Quotidien S.A. Autotransfuser. 4,898,572, Cl. 604-4.000.
Susaki, Shinichi: *See*—
Osaka, Takaak:; Matsui, Norio; Susaki, Shinichi; and Egawa, Yutaka, 4,897,918, Cl. 29-830.000.
Sussman, Morris, to Shore Plastics, Inc. Sliding drawer cosmetic compact. 4,898,195, Cl. 132-317.000.
Suto, Yoshinori; Ito, Toshiyuki; Nakajima, Hideyuki; Okamura, Keiichiro; Nayuki, Shin-ichi; Ogawa, Hiroyasu; and Enomoto, Harumitsu, to Petoca Ltd. Method for producing high strength, high modulus mesophase-pitch based carbon fibers. 4,898,723, Cl. 423-447.400.
Suyama, Takahiro: *See*—
Hayakawa, Toshiro; Suyama, Takahiro; Takahashi, Kohsei; Kondo, Masafumi; and Yamamoto, Saburo, 4,899,349, Cl. 372-44.000.
Suzukamo, Gohfu; Sakito, Yoji; Fukao, Masami; and Hagiya, Koji, to Sumitomo Chemical Company, Ltd. Method for racemization of optically active chrysanthemic acid or its derivatives. 4,898,655, Cl. 204-157.870.
Suzuki, Hisao: *See*—
Sasuga, Kazuyasu; Ishizawa, Hiroaki; Suzuki, Hisao; and Toho, Masato, 4,899,225, Cl. 358-448.000.
Suzuki, Katsuyuki: *See*—
Morii, Mitsuyoshi; Ohoka, Masaharu; Suzuki, Toshihiko; Suzuki, Katsuyuki; Kawashima, Nobuhiro; Morii, Noriko; and Mori, Kunizo, 4,898,825, Cl. 435-212.000.
Suzuki, Kazutoshi: *See*—
Kobayashi, Manabu; Suzuki, Kazutoshi; and Kondo, Takeo, 4,898,144, Cl. 123-52.00M.
Suzuki, Kenji: *See*—
Yamamoto, Masanari; Ito, Yasunobu; and Suzuki, Kenji, 4,899,278, Cl. 364-424.100.
Suzuki, Kiyonori: *See*—
Ito, Nobuhiko; Kinoshita, Kimio; Suzuki, Kiyonori; and Eto, Takeaki, 4,898,985, Cl. 568-344.000.
Suzuki, Masakazu: *See*—
Ikada, Yoshito; Suong, Hyu H.; Shimizu, Yoshihiko; Watanabe, Satoshi; Nakamura, Tatsuo; Suzuki, Masakazu; and Shimamoto, Takeshi, 4,898,186, Cl. 606-62.000.
Suzuki, Mikio: *See*—
Teshima, Toshio; Kitagawa, Tooru; Suzuki, Mikio; Masaoka, Toshi; Mori, Takashi; and Okimoto, Kazutaka, 4,898,226, Cl. 168-415.000.
Suzuki Motor Company, Limited: *See*—
Takada, Yukiya, 4,898,420, Cl. 296-219.000.
Suzuki, Norio, to Juki Corporation. Mechanism for supporting a long flexible element. 4,898,351, Cl. 248-51.000.
Suzuki, Shigenobu: *See*—
Fukahori, Yoshihide; Kojima, Hiromu; Ogino, Akihiko; Suzuki, Shigenobu; and Yoshizawa, Toshikazu, 4,899,323, Cl. 367-176.000.
Suzuki, Shigeru: *See*—
Nomura, Etsuzo; Takeuchi, Hirokazu; Suzuki, Shigeru; Irie, Kazunori; and Itoh, Hirosumi, 4,898,110, Cl. 112-314.000.
Suzuki, Takao: *See*—
Endo, Hiroshi; Suzuki, Takao; Komoto, Mitsuo; Uekido, Kouzou; and Tokaichi, Tetsuro, 4,898,545, Cl. 439-578.000.
Suzuki, Toshihiko: *See*—
Morii, Mitsuyoshi; Ohoka, Masaharu; Suzuki, Toshihiko; Suzuki, Katsuyuki; Kawashima, Nobuhiro; Morii, Noriko; and Mori, Kunizo, 4,898,825, Cl. 435-212.000.
Suzuki, Yoshiyuki: *See*—
Oikawa, Takahiro; Suzuki, Yoshiyuki; and Ohtsuka, Tatsumi, 4,898,031, Cl. 73-505.000.
Swain, Ann: *See*—
Turner, Anthony P. F.; Swain, Ann; Ramsay, Graham; Cardosi, Marco; and Schneider, Bernard H., 4,898,816, Cl. 435-34.000.
Swanson, Brian E.: *See*—
Hay, John; Markhoff-Matheny, Carole J.; and Swanson, Brian E., 4,898,597, Cl. 51-298.000.
Sway-Tin, Min, to Chrysler Motors Corporation. Power module. 4,899,256, Cl. 361-386.000.
Sweeny, Mark: *See*—
Xu, Jingming; Shur, Michael; and Sweeny, Mark, 4,899,201, Cl. 357-22.000.
Swemmers, Antonius H. M.: *See*—
Vroomen, Laurentius C. J.; Van Esdonk, Johannes; Khoe, Giok D.; and Swemmers, Antonius H. M., 4,898,449, Cl. 350-96.210.
Swierb, Gerald E.: *See*—
Hammond, Kenneth W.; Gilbert, Herbert W.; and Swierb, Gerald E., 4,899,262, Cl. 362-80.000.
Swihart, Terence J.: *See*—
Halloran, Daniel J.; Kasprzak, Kenneth A.; Savastano, Stefano G.; and Swihart, Terence J., 4,898,614, Cl. 106-3.000.
Swinderman, R. Todd; Bowman, Michael A.; and Goldbeck, Larry J., to Martin Engineering Company. Conveyor belt support mechanism. 4,898,272, Cl. 198-841.000.
Swisher, David R.; and DeWeese, F. Thane, to Sherwood Medical Company. Autotransfusion bag holder. 4,898,593, Cl. 604-319.000.
Swofford, Howard W., to Hoechst Celanese Coproration. Polyester film primed with an aminofunctional silane, and film laminates thereof. 4,898,786, Cl. 428-480.000.
Symons, Robert H., to Bresatac Limited. Compounds used as intermediates in the preparations of non-radioactive biological probes. 4,898,951, Cl. 548-303.000.
Syron Engineering and Manufacturing Corporation: *See*—
Herbermann, Alfred F.; and Carabbio, Robert M., 4,898,490, Cl. 403-56.000.
Szczepanski, Henry; and Wals, Lourens, to Ciba-Geigy Corporation. Herbicidal imidazole derivatives. 4,898,607, Cl. 71-92.000.
Szucs, Stephen S.; Quakenbush, Laura S.; and Marc, Pierre A., to American Cyanamid Company. 4-cyano-4-(fluorophenyl)-3-(substituted phenyl) butyric acids, esters and derivatives thereof, and a method of selectively controlling undesirable vegetation in rice therewith. 4,898,609, Cl. 71-105.000.
T&N Materials Research Limited: *See*—
Atkinson, Alan W.; and Smith, David N., 4,898,701, Cl. 264-109.000.
Tabata, Teruo: *See*—
Fujinuma, Chikao; Sekikawa, Nobuyuki; Tabata, Teruo; Takada, Tadayoshi; Sano, Yoshiaki; and Sadakata, Toshimasa, 4,898,839, Cl. 437-33.000.
Tachibana, Hidekiyo; Noda, Akihiko; Terao, Kazuo; Honjou, Toshio; Seki, Yukio; Endo, Hiroshi; and Yokobari, Toshio, to Fuji Xerox Co., Ltd.; and Nippon Iron Powder Co., Ltd. Magnetic carrier of developer for electrophotographic copying machines composed of ferrite and a selected metal oxide. 4,898,801, Cl. 430-106.600.
Tachibana, Noriki; Nishizeki, Masato; and Kagawa, Nobuaki, to Konica Corporation. Antistatic silver halide photographic light-sensitive material. 4,898,808, Cl. 430-510.000.
Taguchi, Tomishige: *See*—
Ogura, Tokihiko; Mizoguchi, Yoshiyuki; Ikeda, Keiichi; and Taguchi, Tomishige, 4,899,171, Cl. 346-76.0PH.
Taiho Kogyo Co., Ltd.: *See*—
Kawakami, Shinya; and Kikuchi, Masahara, 4,898,905, Cl. 524-404.000.

Taiho Pharmaceutical Company, Limited: *See*—
Kazuo, Ogawa; Ichiro, Yamawaki; Yoichi, Matsushita; Naruo, Nomura; and Issei, Okazaki, 4,898,867, Cl. 514-258.000.
Torii, Sigeru; Tanaka, Hideo; Tanaka, Motoaki; Yamada, Shozo; and Nakai, Akira, 4,898,939, Cl. 540-310.000.

Taisei Road Construction Co., Ltd.: *See*—
Motomura, Masatoshi; Muramatsu, Ichiro; Okoshi, Noboru; Araki, Yoshitami; Nomura, Kenichiro; Kozai, Takehisa; and Mita, Hiroshi, 4,898,617, Cl. 106-281.100.
Sasaki, Hideo, 4,898,472, Cl. 366-18.000.

Takada, Mitsuyuki; Takasago, Hayato; and Onishi, Yoichiro, to Mitsubishi Denki Kabushiki Kaisha. Method for fabricating hybrid integrated circuit. 4,898,805, Cl. 430-315.000.

Takada, Tadayoshi: *See*—
Fujinuma, Chikao; Sekikawa, Nobuyuki; Tabata, Teruo; Takada, Tadayoshi; Sano, Yoshiaki; and Sadakata, Toshimasa, 4,898,839, Cl. 437-33.000.

Takada, Yukiya, to Suzuki Motor Company, Limited. Vehicular openable roof hood. 4,898,420, Cl. 296-219.000.

Takagi, Ryuhei: *See*—
Ito, Shigeo; Imaeda, Toshihiko; Takagi, Ryuhei; and Sato, Ryutaro, 4,898,317, Cl. 228-41.000.

Takahara, Kenji: *See*—
Asada, Masanori; Hamaguchi, Shigeki; Katsuki, Hidetoshi; Nakamura, Yoshio; Takahashi, Hideyuki; Takahara, Kenji; Shimada, Yoshio; Ohashi, Takehisa; and Watanabe, Kiyoshi, 4,898,822, Cl. 435-121.000.

Takahashi, Hayashi: *See*—
Yoshinari, Osamu; Kawakatsu, Yoshifumi; Takahashi, Hayashi; and Fukuizumi, Hideaki, 4,898,700, Cl. 264-83.000.

Takahashi, Hideyuki: *See*—
Asada, Masanori; Hamaguchi, Shigeki; Katsuki, Hidetoshi; Nakamura, Yoshio; Takahashi, Hideyuki; Takahara, Kenji; Shimada, Yoshio; Ohashi, Takehisa; and Watanabe, Kiyoshi, 4,898,822, Cl. 435-121.000.

Takahashi, Kohsei: *See*—
Hayakawa, Toshiro; Suyama, Takahiro; Takahashi, Kohsei; Kondo, Masafumi; and Yamamoto, Saburo, 4,899,349, Cl. 372-44.000.

Takahashi, Masanori: *See*—
Torigai, Katsumi; and Takahashi, Masanori, 4,898,563, Cl. 440-1.000.

Takahashi, Satoshi: *See*—
Ishimochi, Haruki; Yamamura, Kimio; Fukuyama, Yuji; Yanai, Masato; and Takahashi, Satoshi, 4,899,139, Cl. 340-721.000.

Takahashi, Yutaka, to Japan Silicon Co., Ltd.; and Mitsubishi Kinzoku Kabushiki Kaisha. Polishing apparatus. 4,897,966, Cl. 51-131.300.

Takamatsu, Hisao: *See*—
Hitoshio, Akio; Takamatsu, Hisao; and Hattori, Reiko, 4,898,820, Cl. 435-95.000.

Takamine, Yoshio: *See*—
Omoda, Koichiro; Miyamoto, Shunsuke; Nakagawa, Takayuki; Takamine, Yoshio; Nagashima, Shigeo; Miyoshi, Masayuki; Kazama, Yoshiharu; and Kinoshita, Yoshiaki, 4,899,273, Cl. 364-200.000.

Takano, Masayuki; Hiki, Susumu; and Kikuti, Yuusiti, to Kabushiki Kaisha Toshiba. Ultrasonic probe with finger grip adapter. 4,898,177, Cl. 128-662.030.

Takano, Mikio: *See*—
Tasaki, Yoji; Kurokawa, Koichi; Hattori, Katsuhide; Takano, Mikio; Miyajima, Toshikazu; Sato, Toshifumi; and Ogasawara, Katsura, 4,898,095, Cl. 102-201.000.

Takasago, Hayato: *See*—
Takada, Mitsuyuki; Takasago, Hayato; and Onishi, Yoichiro, 4,898,805, Cl. 430-315.000.

Takasu, Yoshio: *See*—
Osato, Yoichi; Saito, Ichiro; and Takasu, Yoshio, 4,899,168, Cl. 346-1.100.

Takata, Koji: *See*—
Kohno, Teruhisa; Hashida, Koichi; and Takata, Koji, 4,898,434, Cl. 303-119.000.

Takeda Chemical Industries, Ltd.: *See*—
Horii, Satoshi; and Fukase, Hiroshi, 4,898,986, Cl. 568-376.000.
Meguro, Kanji; Fujita, Takeshi; Hatanaka, Chitoshi; and Ooi, Satoru, 4,898,947, Cl. 546-280.000.
Shiraki, Hiroyuki, 4,898,922, Cl. 528-60.000.

Takeda, Kazuo; Sekikawa, Nobuyuki; Hayasaka, Katsuhiro; Fujunuma, Chikao; Itoh, Nobuo; and Kubota, Tetsuya, to Sanyo Electric Co., Ltd. Method of fabricating a semiconductor integrated circuit. 4,898,837, Cl. 437-31.000.

Takegata, Setsuko: *See*—
Nakai, Satoru; Kaneta, Mayumi; Kikumoto, Yoshikazu; Hong, Yeong-Man; Kawai, Kazuyoshi; Takegata, Setsuko; Ishii, Kiyoshi; Yanagihara, Yasuo; and Hirai, Yoshikatsu, 4,898,818, Cl. 435-69.100.

Takegawa, Yujiro, to Tsudakoma Corp. Device for mending and trimming broken warp yarn. 4,898,213, Cl. 139-1.00R.

Takei, Katsumori, to Seiko Epson Corporation. Imprinting apparatus. 4,899,169, Cl. 346-742.000.

Takeichi, Yasutoshi: *See*—
Itoh, Seiga; Takeichi, Yasutoshi; and Sato, Moriyuki, 4,898,931, Cl. 530-351.000.

Takemoto Yushi Kabushiki Kaisha: *See*—
Kinoshita, Mitsuo; Imamura, Shigeru; and Matsueda, Hirokazu, 4,898,964, Cl. 558-416.000.
Kinoshita, Mitsuo; Imamura, Shigeru; and Matsueda, Hirokazu, 4,898,965, Cl. 558-416.000.

Takenaka, Yoshinori; Fukumi, Hirokazu; and Sekiguchi, Sadayoshi, to Asahi Medical Co., Ltd. Blood components collector unit. 4,898,573, Cl. 604-6.000.

Takenouchi, Masanori: *See*—
Harada, Toshiaki; Yamamoto, Tadashi; and Takenouchi, Masanori, 4,899,175, Cl. 346-108.000.

Takenouchi, Shigeki: *See*—
Fujimaki, Yoshihide; and Takenouchi, Shigeki, 4,898,799, Cl. 430-59.000.

Takeuchi, Hirokazu: *See*—
Nomura, Etsuzo; Takeuchi, Hirokazu; Suzuki, Shigeru; Irie, Kazunori; and Itoh, Hirosumi, 4,898,110, Cl. 112-314.000.

Takeuchi, Kiyoshi, to Nissan Motor Co., Ltd. Piezoelectric pressure measuring instrument. 4,898,024, Cl. 73-115.000.

Takeuchi, Mikio: *See*—
Futami, Tohru; and Takeuchi, Mikio, 4,898,010, Cl. 70-278.000.

Takeuchi, Muneo; Kinbara, Hiroji; and Tsuruta, Masafumi, to Nippon-denso Co., Ltd. 3-position rotational actuator. 4,899,073, Cl. 310-116.000.

Takeuchi, Shinji, to Daiwa Seiko, Inc. Bail reversing structure for fishing spinning reels. 4,898,339, Cl. 242-231.000.

Takeuchi, Tatsuo: *See*—
Sugata, Masao; Den, Tohru; Ito, Susumu; Hirabayashi, Keiji; Ikoma, Keiko; Kurihara, Noriko; Osabe, Kuniji; Takeuchi, Tatsuo; Satomura, Hiroshi; Oguchi, Yoshihiro; Maruyama, Akio; and Saito, Keishi, 4,898,798, Cl. 430-58.000.

Takewa, Hiroyuki; Serikawa, Mitsuhiko; Ishikawa, Seiichi; Usuki, Sawako; Kimura, Yoichi; and Obata, Shuichi, to Matsushita Electric Industrial Co., Ltd. Thin speaker having an enclosure within an open portion and a closed portion. 4,899,390, Cl. 381-154.000.

Takeya, Noriyoshi; Ishii, Hidehiro; Watanabe, Osamu; Yoshio, Junichi; Katakami, Kazuhiko; and Izumo, Takeshi, to Pioneer Electronic Corporation. Magazine-housed disk player. 4,899,326, Cl. 369-36.000.

Taki, Katsumi: *See*—
Ogata, Seishiro; and Taki, Katsumi, 4,898,065, Cl. 475-179.000.

Takimoto, Hiroyuki: *See*—
Maeda, Masaya; Takimoto, Hiroyuki; and Kozuki, Susumu, 4,899,231, Cl. 360-33.100.

Talanker, Vera; and Greenwald, Martin, to United States of America, Energy. Microwave measurement of the mass of frozen hydrogen pellets. 4,899,100, Cl. 324-636.000.

Talson Transport Engineering, B.V.: *See*—
Thunnissen, Kees W., 4,898,509, Cl. 414-495.000.

Tamada, Hitoshi; Kaneko, Masahiko; and Okamoto, Tsutomu, to Sony Corporation. Optical waveguide device. 4,898,440, Cl. 350-96.130.

Tamamura, Toshiaki; Katsuta; Niwa, Osamu; Hikita, Makoto; and Sugita, Akio, to Nippon Telegraph and Telephone Corporation. Polymer film with conductive pattern and method of manufacturing the same. 4,898,766, Cl. 428-195.000.

Tamanoi Vinegar Corporation Limited: *See*—
Yamamoto, Takehiko; Kubota, Terumasa; Itoh, Isao; Kato, Hiroyuki; Kikuchi, Terumi; Kawasaki, Hiroko; Mashimoto, Misako; and Oki, Yuji, 4,898,738, Cl. 426-17.000.

Tamba, Shinichi; Miyazaki, Takeshi; and Miguchi, Akio, to Kawasaki Jukogyo Kabushiki Kaisha. Power transmission apparatus. 4,898,040, Cl. 74-15.630.

Tamura, Takahiro: *See*—
Sakurai, Kazuo; and Tamura, Takahiro, 4,898,521, Cl. 418-55.000.

Tanaka, Hideo: *See*—
Nishitani, Takao; Kawakami, Yuichi; Tanaka, Hideo; and Kuroda, Ichiro, 4,899,301, Cl. 364-726.000.
Torii, Sigeru; Tanaka, Hideo; Tanaka, Motoaki; Yamada, Shozo; and Nakai, Akira, 4,898,939, Cl. 540-310.000.

Tanaka, Kouichi: *See*—
Toda, Fumio; Tanaka, Kouichi; Taniguchi, Masatoshi; and Sasaoka, Michio, 4,898,654, Cl. 204-157.710.

Tanaka, Motoaki: *See*—
Torii, Sigeru; Tanaka, Hideo; Tanaka, Motoaki; Yamada, Shozo; and Nakai, Akira, 4,898,939, Cl. 540-310.000.

Tanaka, Toshihide: *See*—
Matsumura, Mitsuie; Tanaka, Toshihide; Urushibata, Hiroaki; and Sato, Kazunao, 4,898,793, Cl. 429-38.000.

Tanashin Denki Co., Ltd.: *See*—
Kido, Kunio, 4,899,239, Cl. 360-106.000.

Tandem Computers Incorporated: *See*—
Ferchau, Joerg U.; Pham, Hoa V.; and Diaz, Randall J., 4,899,254, Cl. 361-384.000.
Lenoski, Daniel E., 4,899,307, Cl. 365-78.000.

Taniguchi, Masatoshi: *See*—
Toda, Fumio; Tanaka, Kouichi; Taniguchi, Masatoshi; and Sasaoka, Michio, 4,898,654, Cl. 204-157.710.

Taniguchi, Osamu: *See*—
Okada, Shinjiro; Taniguchi, Osamu; Tsuboyama, Akira; and Enari, Masahiko, 4,898,456, Cl. 350-350.00S.

Taniguchi, Yoshiaki: *See*—
Ohe, Takeshi; Taniguchi, Yoshiaki; and Nishikiori, Hiroshi, 4,898,258, Cl. 180-79.100.

Tanikoshi, Sadao: *See*—
Shibagaki, Taro; Atsumi, Takehiko; Ibe, Hiroyuki; and Tanikoshi, Sadao, 4,899,339, Cl. 370-102.000.

Tanimoto, Koji; Miura, Kunihiko; and Koseki, Junichi, to Kabushiki Kaisha Toshiba. Image reading apparatus which corrects for a reading error caused by reading an image at a continuously-variable

image reading density with staggered line image sensors. 4,899,226, Cl. 358-451.000.
Tapley, Robin R.; Hatkoski, James W.; and Hatkoski, Richard J., to Hatkoski, Richard. Out-rigger assembly. 4,898,113, Cl. 114-283.000.
Tarhay, Leo: *See—*
Haluska, Loren A.; Michael, Keith W.; and Tarhay, Leo, 4,898,907, Cl. 524-490.000.
Tarr, Richard D.: *See—*
Katritzky, Alan R.; Krepski, Larry R.; Rasmussen, Jerald K.; Heilmann, Steven M.; and Tarr, Richard D., 4,898,923, Cl. 528-73.000.
Tasaki, Yoji; Kurokawa, Koichi; Hattori, Katsuhide; Takano, Mikio; Miyajima, Toshikazu; Sato, Toshifumi; and Ogasawara, Katsura, to Nippon Oil and Fats Company, Limited and Kajima Corporation; and Kajima Corporation. Laser beam-detonatable blasting cap. 4,898,095, Cl. 102-201.000.
Tatara, Yudai; Sato, Kiyoomi; Okawa, Susumu; and Jufuku, Yasunobu, to Toyota Jidosha Kabushiki Kaisha. Pulleys for belt-and-pulley type continuously variable transmission. 4,898,567, Cl. 474-174.000.
Tatoun, Antonin: *See—*
Fencl, Zdenek; Janda, Frantisek; Kovarik, Karel; Sara, Jiri ; and Tatoun, Antonin, 4,898,006, Cl. 62-48.200.
Tatsumi, Setsuji; Shiota, Kazuo; Urabe, Hitoshi; and Shimazaki, Osamu, to Fuji Photo Film Co., Ltd. Method of and apparatus for processing an image with gradation correction of video signal. 4,899,216, Cl. 358-80.000.
Taylor, Harry L.: *See—*
Ocello, Dennis M.; and Taylor, Harry L., 4,898,411, Cl. 292-292.000.
Taylor, Leo O.; and Healey, Fritz W., to Loral Electro-Optical Systems Inc. Photodetector array for soft hat mounting using a loop antenna. 4,899,039, Cl. 250-209.000.
Taylor, Richard S., to Manitowoc Company, Inc., The. Ice machine. 4,898,002, Cl. 62-71.000.
Taylor, Rosemary M.: *See—*
Fridd, Petrina F.; and Taylor, Rosemary M., 4,898,595, Cl. 8-405.000.
TDK Corporation: *See—*
Hashizume, Kenji; Ikebe, Masaru; Okamura, Masatoshi; and Shiba, Haruo, 4,899,242, Cl. 360-132.000.
Tektronix, Inc.: *See—*
Odenthal, Conrad J., 4,899,091, Cl. 315-382.000.
Teledyne Industries, Inc.: *See—*
Edelmayer, Thomas C., 4,898,522, Cl. 418-61.200.
Rosenthal, Wayne O., 4,898,239, Cl. 166-133.000.
Teleflex Incorporated: *See—*
McBeth, James B., 4,898,077, Cl. 91-505.000.
Telettra Telefonia Elettronica e Radio S.p.A.: *See—*
Cucchi, Silvio; and Corradi, Vittorio, 4,899,352, Cl. 375-118.000.
Tellier, Thomas A., to Xerox Corporation. Thermal ink jet printhead with internally fed ink reservoir. 4,899,178, Cl. 346-140.00R.
Tencor Instruments: *See—*
Adams, Arnold, 4,899,055, Cl. 250-372.000.
Vaught, John L.; Neukermans, Armand P.; Keldermann, Herman F.; and Koenig, Franklin R., 4,898,471, Cl. 356-394.000.
Tenmat Ltd.: *See—*
Laflin, Philip; and Molyneux, Ian, 4,898,769, Cl. 428-283.000.
Tennessee Tool and Engineering, Inc.: *See—*
Palmer, Larry R., 4,898,501, Cl. 408-32.000.
Tenney, Linwood P.: *See—*
Lane, Parley C.; Tenney, Linwood P.; Benedikt, George M.; and Stricharczuk, Paul T., 4,899,005, Cl. 585-360.000.
Tepley, George T., to TGC Corporation. Hand measurement apparatus. 4,897,924, Cl. 33-2.00R.
Terane, Hideyuki; and Ishihara, Kazuya, to Mitsubishi Denki Kabushiki Kaisha. Overflow detection circuit. 4,899,304, Cl. 364-745.000.
Terao, Kazuo: *See—*
Tachibana, Hidekiyo; Noda, Akihiko; Terao, Kazuo; Honjou, Toshio; Seki, Yukio; Endo, Hiroshi; and Yokobari, Toshio, 4,898,801, Cl. 430-106.600.
Terbrack, Ulrich: *See—*
Siol, Werner; and Terbrack, Ulrich, 4,898,912, Cl. 525-199.000.
Terdan, Dale R.: *See—*
Tratar, Michael F.; Bremenour, Edwin L.; and Terdan, Dale R., 4,898,538, Cl. 439-76.000.
Terumo Kabushiki Kaisha: *See—*
Sano, Yoshikazu; Kobayashi, Susumu; and Endo, Kiyoshi, 4,899,297, Cl. 364-557.000.
Terzian, John, to Raytheon Company. Method of guiding missiles. 4,898,341, Cl. 244-3.160.
Teshima, Toshio; Kitagawa, Tooru; Suzuki, Mikio; Masaoka, Toshi; Mori, Takashi; and Okimoto, Kazutaka, to NKK Corporation. Immersion nozzle for continuous casting of steel. 4,898,226, Cl. 168-415.000.
Tesio, Franco, to Claber S.p.A. Vascular access device, in particular for purification treatments of the blood. 4,898,669, Cl. 210-232.000.
Tetu, Michel: *See—*
Cyr, Normand; Tetu, Michel; and Giordano, Vincent, 4,899,345, Cl. 372-32.000.
Teutscher, Michael: *See—*
Siepmann, Friedrich W.; and Teutscher, Michael, 4,898,829, Cl. 435-289.000.
Texaco Chemical Company: *See—*
Knifton, John F., 4,898,987, Cl. 568-385.000.
Knifton, John F.; and Sanderson, John R., 4,898,995, Cl. 568-798.000.
Texaco Inc.: *See—*
Friedman, Robert H.; and Surles, Billy W., 4,898,750, Cl. 427-221.000.
Pasternak, Mordechai; and Dorawala, Tansukhlal G., 4,898,674, Cl. 210-638.000.
Sayles, Scott M.; Livingston, William B.; and Bellinger, Michael P., 4,898,663, Cl. 208-178.000.
Texas Instruments Incorporated: *See—*
Blake, Terence G. W.; and Lu, Hsindao, 4,899,202, Cl. 357-23.700.
Hashimoto, Masashi, 4,899,229, Cl. 360-141.000.
Houston, Theodore W., 4,899,315, Cl. 365-230.060.
Morris, Francis J.; and Evans, Stephen A., 4,898,838, Cl. 437-31.000.
Van Wechem, Guus; Beunk, Gerrit; Van Den Elst, Frits; and Van Der Ploeg, Arie, 4,898,142, Cl. 123-557.000.
Texas Iron Works, Inc.: *See—*
Braddick, Britt O., 4,898,245, Cl. 166-387.000.
TGC Corporation: *See—*
Tepley, George T., 4,897,924, Cl. 33-2.00R.
Th. Goldschmidt AG: *See—*
Priesch, Manfred; Rau, Harald; and Weitemeyer, Christian, 4,898,772, Cl. 428-332.000.
Thebeau, Donald W. Load carrying skid assembly. 4,898,102, Cl. 108-56.100.
Theodoridis, George, to FMC Corporation. Phosphorylaminophenyltriazolinone herbicides. 4,898,606, Cl. 71-86.000.
Thermostat-und Schaltgeraetebau GmbH & Co. KG: *See—*
Hollweck, Walter, 4,899,124, Cl. 337-299.000.
Thinking Machines Corporation: *See—*
Callahan, Thomas, 4,898,544, Cl. 439-498.000.
Potter, David; Provost, Laurence N.; Baron, John M.; Stefanovic, David; Sharakan, Eric D.; Sheppard, David A.; and Isman, Marshall A., 4,899,342, Cl. 371-10.100.
Thomas, Gunther: *See—*
Franckowiak, Gerhard; Bechem, Martin; Kayser, Michael; Gross, Rainer; Schramm, Matthias; Seuter, Friedel; Perzborn, Elisabeth; and Thomas, Gunther, 4,898,865, Cl. 514-252.000.
Thomasson, Robert E.: *See—*
Lewis, George E.; Thomasson, Robert E.; and Nelson, David W., 4,899,284, Cl. 364-435.000.
Thompson, Owen R. Hydraulic device. 4,898,248, Cl. 173-12.000.
Thorn EMI Electronics Limited: *See—*
Voles, Roger, 4,898,032, Cl. 73-505.000.
Thorne, Glenn A.; Joy, Robert D.; and Simpson, Jeff A., to Bee Line Company. Method and apparatus for determining the position of an object. 4,898,464, Cl. 356-152.000.
Thrall Car Manufacturing Company: *See—*
Harter, Lynn J., 4,898,101, Cl. 105-247.000.
Threshold Corporation: *See—*
Pass, Nelson S., 4,899,387, Cl. 381-71.000.
Thunnissen, Kees W., to Talson Transport Engineering, B.V. Cargo transporter, particularly of the trailer type having a front elevated loading floor. 4,898,509, Cl. 414-495.000.
Thyssen Industrie AG Henschel: *See—*
Manschwetus, Helmut, 4,898,334, Cl. 241-194.000.
Thyssen Stahl AG: *See—*
Lang, Cestmir; and Meyer, Lutz, 4,898,629, Cl. 148-12.00B.
Tillman, Richard M.: *See—*
Allison, Joe D.; and Tillman, Richard M., 4,899,004, Cl. 585-321.000.
Tiramani, Paolo M. B., to Goody Products, Inc. Spray caps. 4,898,307, Cl. 222-207.000.
Tittizer, Gabriel: *See—*
Junghans, Ewald; and Tittizer, Gabriel, 4,898,129, Cl. 123-90.130.
Tittle, Fred: *See—*
Cochran, Ivan L., 4,898,552, Cl. 440-71.000.
TLV Co., Ltd.: *See—*
Yumoto, Hideaki; Yonemura, Masao; Nagase, Mamoru; Yamada, Yoshito; Fujiwara, Yoshiyasu; Okamoto, Masakatsu; and Hosokawa, Yasutoshi, 4,898,022, Cl. 73-46.000.
To, Ping K. Musical adapter for nursing bottle. 4,898,060, Cl. 84-95.200.
Toagosei Chemical Industry Co.: *See—*
Isobe, Yasuji, 4,898,899, Cl. 524-90.000.
Tobita, Etsuo: *See—*
Nakahara, Yutaka; and Tobita, Etsuo, 4,898,688, Cl. 252-400.240.
Tobler, Markus: *See—*
Frey, Yvonne; Kutzli, Jorg; Rauber, Walter; Schmocker, Hans; and Tobler, Markus, 4,898,098, Cl. 102-334.000.
Tochiyama, Kazunori; and Mihara, Takahisa, to Fujitsu Limited. Divided housing for supporting magnetic disks. 4,899,237, Cl. 360-98.020.
Toda, Fumio; Tanaka, Kouichi; Taniguchi, Masatoshi; and Sasaoka, Michio, to Otsuka Kagaku Kabushiki Kaisha. Method of producing optically active β-lactam derivatives. 4,898,654, Cl. 204-157.710.
Toho, Masato: *See—*
Sasuga, Kazuyasu; Ishizawa, Hiroaki; Suzuki, Hisao; and Toho, Masato, 4,899,225, Cl. 358-448.000.
Toho Rayon Co., Ltd.: *See—*
Yoshinari, Osamu; Kawakatsu, Yoshifumi; Takahashi, Hayashi; and Fukuizumi, Hideaki, 4,898,700, Cl. 264-83.000.
Tokaichi, Tetsuro: *See—*
Endo, Hiroshi; Suzuki, Takao; Komoto, Mitsuo; Uekido, Kouzou; and Tokaichi, Tetsuro, 4,898,545, Cl. 439-578.000.
Tokin Corporation: *See—*
Otsuka, Tsutomu; and Otsuki, Etsuo, 4,898,625, Cl. 148-101.000.

Tokyo Electron Limited: *See*—
Akiyama, Shuji, 4,899,105, Cl. 324-158.00F.
Tokyo Sanyo Electric Co., Ltd.: *See*—
Tsuchiyama, Yuji; and Shimizu, Masayuki, 4,898,230, Cl. 165-12.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Kuze, Takashi, 4,898,622, Cl. 148-2.000.
Toledo Scale Corporation: *See*—
Gaines, Ronald J., 4,898,255, Cl. 177-211.000.
Tomihashi, Nobuyuki: *See*—
Yoshimura, Tatsushiro; Tomihashi, Nobuyuki; and Simasaki, Shuhei, 4,898,779, Cl. 428-402.000.
Tomimitsu, Yasuharu, to NEC Corporation. Error correction circuit. 4,899,341, Cl. 371-37.600.
Tomita, Koji: *See*—
Konishi, Masataka; Tomita, Koji; Oka, Masahisa; and Numata, Ken-ichi, 4,898,940, Cl. 540-460.000.
Tomizawa, Takashi: *See*—
Horaguchi, Yoichi; Tomizawa, Takashi; Hayashi, Shigeyuki; Ohno, Motoshi; and Nakata, Takashi, 4,899,193, Cl. 355-55.000.
Toray Silicone Company, Ltd.: *See*—
Hamada, Mitsuo; Shimizu, Koji; and Wakita, Haruki, 4,898,689, Cl. 252-510.000.
Yoshitake, Makoto; Yamane, Shinichiro; and Shirahata, Akihiko, 4,898,959, Cl. 556-466.000.
Torbet, Philip: *See*—
Dolgin, Stuart M.; and Torbet, Philip, 4,898,589, Cl. 604-198.000.
Torigai, Katsumi; and Takahashi, Masanori, to Sanshin Kogyo Kabushiki Kaisha. Trim apparatus for marine propulsion unit. 4,898,563, Cl. 440-1.000.
Torii, Kohske: *See*—
Ueda, Ryuichi; Mori, Masahito; and Torii, Kohske, 4,898,919, Cl. 525-440.000.
Torii, Sigeru; Tanaka, Hideo; Tanaka, Motoaki; Yamada, Shozo; and Nakai, Akira, to Taiho Pharmaceutical Co., Ltd.; and Otsuka Kagaku Kabushiki Kaisha. Process for preparing 2β-substituted-methylpenicillin derivatives. 4,898,939, Cl. 540-310.000.
Torrington Product Ventures, Inc.: *See*—
Brose, Peter W., 4,898,120, Cl. 119-29.000.
Tortella, Frank C.: *See*—
Musacchio, Jose M.; and Tortella, Frank C., 4,898,860, Cl. 514-215.000.
Tosoh Corporation: *See*—
Ogura, Eiji; Mito, Kunihiro; and Arai, Shoji, 4,898,970, Cl. 560-236.000.
Total Walther Feuerschutz GmbH: *See*—
Riedle, Armin; and Zientek, Horst, 4,898,246, Cl. 169-38.000.
Toth, Bartholomew L.: *See*—
Brown, Bernard T.; Donnelly, Donald E.; and Toth, Bartholomew L., 4,898,229, Cl. 165-11.100.
Touhsaent, Robert E.: *See*—
Min, Taeik; and Touhsaent, Robert E., 4,898,782, Cl. 428-407.000.
Min, Taeik; and Touhsaent, Robert E., 4,898,787, Cl. 428-480.000.
Towle, Ian D. H., to Raychem Limited. Preparation of aryl carbonyl compounds. 4,898,983, Cl. 568-322.000.
Toyama, Sachio: *See*—
Fujii, Setsuro; Ishikawa, Hiroshi; Yasumura, Koichi; Jitsukawa, Koichiro; Toyama, Sachio; Tsubouchi, Hidetsugu; Sudo, Kimio; and Tsuji, Kouichi, 4,898,859, Cl. 514-210.000.
Toyo Seikan Kaisha, Ltd.: *See*—
Yamada, Morio; and Kimura, Yoshihiko, 4,898,023, Cl. 73-52.000.
Toyo Soda Manufacturing Co., Ltd.: *See*—
Kubo, Masashige; Sakka, Hideo; and Tsutsumi, Yukihiro, 4,898,998, Cl. 570-204.000.
Toyoda Gosei Co., Ltd.: *See*—
Ohno, Satoshi; and Hiramitsu, Tetsushi, 4,899,020, Cl. 174-68.500.
Toyoda Koki Kabushiki Kaisha: *See*—
Maruyama, Toshio; Oda, Yukio; and Yamaguchi, Syoji, 4,897,967, Cl. 51-165.870.
Toyota Jidosha Kabushiki: *See*—
Kitoh, Osamu; and Ohashi, Masahiko, 4,898,630, Cl. 156-79.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Tatara, Yudai; Sato, Kiyoomi; Okawa, Susumu; and Jufuku, Yasunobu, 4,898,567, Cl. 474-174.000.
Tran, Danh C.: *See*—
Kindler, Edwin A.; and Tran, Danh C., 4,898,777, Cl. 428-364.000.
Tran, Duc H.: *See*—
Berson, William; Gluck, Julius; Murphy, Patrick; Smith, Christopher D.; and Tran, Duc H., 4,899,172, Cl. 346-76.0PH.
Tratar, Michael F.; Bremenour, Edwin L.; and Terdan, Dale R., to Allen-Bradley Company, Inc. Self aligning connector. 4,898,538, Cl. 439-76.000.
Tremblay, Andre : *See*—
Tweedle, Thomas A.; Kutowy, Oleh; and Tremblay, Andre , 4,898,698, Cl. 264-41.000.
Trick, Robert E.: *See*—
Daly, Mark D.; Maerzke, James T.; Gengler, Jeffrey R.; and Trick, Robert E., 4,898,158, Cl. 128-79.000.
Triem, Hermann: *See*—
Hempel, Gerhard; Kennecke, Mario; Krieger, Bernhard; Phillippson, Rainer; Triem, Hermann; and Weber, Alfred, 4,898,693, Cl. 260-397.400.
Tripodi, Paul, to Merlin Gerin. Solid-state trip device comprising a zero sequence current detection circuit. 4,899,246, Cl. 361-44.000.
Trivino Vazquez, Fernando; and Clenin, Roger J., to Catrel S.A. Societe D'Etudes et D'Applications Industrielle. Method of manufacturing cement. 4,898,615, Cl. 106-103.000.
Trojan Luggage Company, The: *See*—
Stout, Darwin E.; Wilcox, Robert C.; and Peloquin, Charles A., 4,898,274, Cl. 206-289.000.
Trondle, Robert: *See*—
Weisshuhn, Elmer; Bubik, Alfred; Dahl, Hans; Holik, Herbert; Kurtz, Rudiger; Zembrot, Anton; Stotz, Wolf-Gunter; Seider, Werner; and Trondle, Robert, 4,898,643, Cl. 162-259.000.
Tropp, James S.; Derby, Kevin A.; and Hawryszko, K. Christine, to Diasonics Inc. Method and apparatus for automated magnetic field shimming in magnetic resonance spectroscopic imaging. 4,899,109, Cl. 324-320.000.
Trout, Kenneth G.: *See*—
Israel, Michael G.; Grozdits, George A.; and Trout, Kenneth G., 4,898,776, Cl. 428-336.000.
Troutner, David E.: *See*—
Simon, Jaime; Wilson, David A.; Volkert, Wynn A.; Troutner, David E.; and Goeckeler, William F., 4,898,724, Cl. 424-1.100.
TRW Inc.: *See*—
Bianchi, Maurice P., 4,898,347, Cl. 244-158.00R.
Tsai, David M. Remote control animal collar. 4,898,119, Cl. 119-29.000.
Tschanen, Mark S.: *See*—
Large, Danny E.; and Tschanen, Mark S., 4,898,303, Cl. 222-65.000.
Tsinberg, Mikhail: *See*—
Basile, Carlo; Cavallerano, Alan P.; and Tsinberg, Mikhail, 4,899,220, Cl. 358-141.000.
Tsubouchi, Hidetsugu: *See*—
Fujii, Setsuro; Ishikawa, Hiroshi; Yasumura, Koichi; Jitsukawa, Koichiro; Toyama, Sachio; Tsubouchi, Hidetsugu; Sudo, Kimio; and Tsuji, Kouichi, 4,898,859, Cl. 514-210.000.
Tsuboyama, Akira: *See*—
Okada, Shinjiro; Taniguchi, Osamu; Tsuboyama, Akira; and Enari, Masahiko, 4,898,456, Cl. 350-350.00S.
Tsuchiyama, Yuji; and Shimizu, Masayuki, to Sanyo Electric Co., Ltd.; and Tokyo Sanyo Electric Co., Ltd. Air conditioner with an energy switch. 4,898,230, Cl. 165-12.000.
Tsudakoma Corp.: *See*—
Takegawa, Yujiro, 4,898,213, Cl. 139-1.00R.
Tsui, Yih-Pyng: *See*—
Mlodzikowski, Allan G.; Tsui, Yih-Pyng; and Ku, Hai-Pin, 4,899,388, Cl. 381-77.000.
Tsuji, Kenji; and Ichikawa, Tsutomu, to Minolta Camera Kabushiki Kaisha. Juxtaposed discharge tubes with opposed trigger electrodes. 4,899,092, Cl. 313-594.000.
Tsuji, Kouichi: *See*—
Fujii, Setsuro; Ishikawa, Hiroshi; Yasumura, Koichi; Jitsukawa, Koichiro; Toyama, Sachio; Tsubouchi, Hidetsugu; Sudo, Kimio; and Tsuji, Kouichi, 4,898,859, Cl. 514-210.000.
Tsujimura, Osamu; Arai, Tatsuo; Nakayama, Masaaki; and Okawa, Masayuki, to Mitsubishi Kinzoku Kabushiki Kaisha. Ball end mill. 4,898,499, Cl. 407-42.000.
Tsukada, Masaharu; Aoi, Shigeru; and Ashinuma, Takaaki, to Canon Kabushiki Kaisha. Image processing system. 4,899,291, Cl. 364-518.000.
Tsuruta, Masafumi: *See*—
Takeuchi, Muneo; Kinbara, Hiroji; and Tsuruta, Masafumi, 4,899,073, Cl. 310-116.000.
Tsutsumi, Shigeru. Temperature control indicating apparatus of a hot runner in a thermoplastic synthetic resin injection molding system. 4,899,288, Cl. 364-476.000.
Tsutsumi, Yukihiro: *See*—
Kubo, Masashige; Sakka, Hideo; and Tsutsumi, Yukihiro, 4,898,998, Cl. 570-204.000.
Tsuyama Mfg. Co., Ltd.: *See*—
Shiba, Kenzo, 4,898,379, Cl. 272-73.000.
Tsuyama, Toshiaki: *See*—
Nishimura, Eiji; Nobumoto, Kazutoshi; Matsuoka, Toshihiro; Tsuyama, Toshiaki; and Sotoyama, Kaoru, 4,898,138, Cl. 123-399.000.
Tucker, Hugh N.: *See*—
Madsen, David C.; and Tucker, Hugh N., 4,898,879, Cl. 514-400.000.
Tucker, Robert C., Jr.: *See*—
Schaffer, Paul J.; and Tucker, Robert C., Jr., 4,898,368, Cl. 266-222.000.
Tungsram Reszvenytarsasag: *See*—
Antal, Kalman; Rimay, Bela; and Halasz, Ferenc, 4,898,554, Cl. 445-6.000.
Turner, Anthony P. F.; Swain, Ann; Ramsay, Graham; Cardosi, Marco; and Schneider, Bernard H., to Paul de la Pena Limited. Mediators for bioelectrochemical cells to test for microbiological activity. 4,898,816, Cl. 435-34.000.
Turner, Eric E.: *See*—
Shapiro, Bennett M.; Turner, Eric E.; Hopkins, Paul B.; Klevit, Rachel E.; Holler, Tod P.; and Spaltenstein, Andreas, 4,898,878, Cl. 514-386.000.
Tweedle, Thomas A.; Kutowy, Oleh; and Tremblay, Andre , to Canada, National Research Concil of. Method of casting a porous membrane of polymeric material. 4,898,698, Cl. 264-41.000.
Twerdochlib, Michael: *See*—
Weaver, Karen L.; and Twerdochlib, Michael, 4,898,021, Cl. 73-40.700.

UBE Industries, Ltd.: *See*—
Inoue, Hiroshi; Muramatsu, Tadao; Narahara, Yasuji; and Hirano, Tetsuji, 4,898,753, Cl. 427-276.000.
Uchikuga, Saburo: *See*—
Narutomi, Yuji; Katsumata, Manabu; Osawa, Yasuko; and Uchikuga, Saburo, 4,898,870, Cl. 514-292.000.
Uchiyama, Naoki; Shishido, Yoshio; and Ueda, Yasuhiro, to Olympus Optical Co., Ltd. Lithotomic apparatus. 4,898,574, Cl. 604-22.000.
Uchiyama, Yoshihiro: *See*—
Kuroda, Michio; Sato, Isao; Ishibashi, Yoji; Uchiyama, Yoshihiro; Ohmori, Takashi; Akatsu, Shigeyuki; Kato, Fumio; Segawa, Yorihide; and Iizuka, Nobuyuki, 4,898,001, Cl. 60-733.000.
Udagawa, Tsunekazu, to Ishikawa Gasket Co., Ltd. Steel laminate gasket. 4,898,396, Cl. 277-235.00B.
Udd, Eric, to McDonnell Douglas Corporation. Sagnac distributed sensor. 4,898,468, Cl. 356-345.000.
Ueda, Ryuichi; Mori, Masahito; and Torii, Kohske, to Sunstar Giken Kabushiki Kaisha. Polyurethane adhesive. 4,898,919, Cl. 525-440.000.
Ueda, Yasuhiro: *See*—
Uchiyama, Naoki; Shishido, Yoshio; and Ueda, Yasuhiro, 4,898,574, Cl. 604-22.000.
Ueki, Noriyuki; and Nishimura, Shigeru, to Kawasaki Jukogyo Kabushiki Kaisha. Oil relief valve for lubrication systems for internal combustion engines. 4,898,207, Cl. 137-539.000.
Uekido, Kouzou: *See*—
Endo, Hiroshi; Suzuki, Takao; Komoto, Mitsuo; Uekido, Kouzou; and Tokaichi, Tetsuro, 4,898,545, Cl. 439-578.000.
Uemichi, Sachio: *See*—
Furukawa, Hiroshi; Uemichi, Sachio; Isoi, Toshihiro; and Kawakita, Kenzo, 4,898,796, Cl. 429-178.000.
Uemura, Toshinobu; Kai, Keiji; Kodani, Masateru; Yoshida, Fumiyo; and Aratani, Matsuhiko, to Fujisawa Pharmaceutical Co., Ltd. α-crystals of cefazolin sodium. 4,898,937, Cl. 540-227.000.
Uenishi, Isao: *See*—
Nishimura, Makoto; Nonaka, Takashi; Uenishi, Isao; and Goto, Tamotsu, 4,897,990, Cl. 57-247.000.
Ueno, Takehiko: *See*—
Kozoe, Katsutoshi; Furuya, Nobuo; Kimura, Shinichi; Okamoto, Yasunari; Kumada, Mitsuyoshi; Sugimoto, Tatsuo; Ueno, Takehiko; Shimizu, Kenjiro; and Itoh, Tsutomu, 4,898,116, Cl. 118-621.000.
Ueyama, Satoshi; and Isoda, Satoru, to Mitsubishi Denki Kabushiki Kaisha. Method for measuring cell counts and/or methane producing activity of methanogens. 4,898,833, Cl. 436-63.000.
Ugro, Josef V., Jr.: *See*—
Doree, Richard H.; and Ugro, Josef V., Jr., 4,898,633, Cl. 156-145.000.
Ulman, Katherine L.: *See*—
Lee, Chi-Long; and Ulman, Katherine L., 4,898,920, Cl. 525-477.000.
Ulrich, Donald R.: *See*—
Buckley, Alan; Che, Tessie M.; Leslie, Thomas M.; Stamatoff, James B.; Stuetz, Dagobert E.; and Ulrich, Donald R., 4,898,454, Cl. 350-350.00R.
Che, Tesie M.; Stuetz, Dagobert E.; Buckley, Alan; and Ulrich, Donald R., 4,898,755, Cl. 427-389.700.
Ultradent Products, Inc.: *See*—
Fischer, Dan E., 4,898,309, Cl. 223-111.000.
Ultraviolet Purification Systems, Inc.: *See*—
Ellner, Sidney, 4,899,056, Cl. 250-431.000.
Umeki, Tsunenori: *See*—
Aikawa, Masatoshi; Nakagawa, Hiromasa; and Umeki, Tsunenori, 4,899,066, Cl. 307-45.200.
Union Carbide Chemicals and Plastics Company Inc.: *See*—
Manyik, Robert M.; Brockwell, Jonathan L.; and Kendall, John E., 4,899,003, Cl. 585-313.000.
Union Carbide Corporation. *See*—
Schaffer, Paul J.; and Tucker, Robert C., Jr., 4,898,368, Cl. 266-222.000.
Wilson, Stephen T.; Lok, Brent M.; and Flanigen, Edith M., 4,898,660, Cl. 208-114.000.
Unisys Corporation: *See*—
Petschauer, Richard J.; and Bergman, Robert J., 4,899,311, Cl. 365-189.060.
Schiavo, Anthony P.; Selby, Paul H., III; and Gibson, Harold L., 4,899,147, Cl. 341-60.000.
United Engineering, Inc.: *See*—
Ginzburg, Vladimir B.; and Vidil, F. Ronald, 4,898,014, Cl. 72-247.000.
Jones, George B.; and Mills, Edward A., 4,898,012, Cl. 72-11.000.
United Kingdom Atomic Energy Authority: *See*—
Clayton, Colin G., 4,898,709, Cl. 376-159.000.
United States of America
Air Force: *See*—
Hutta, Joseph J., 4,898,603, Cl. 65-3.130.
McGrath, Daniel T., 4,899,164, Cl. 343-754.000.
Army: *See*—
Vig, John R., 4,899,117, Cl. 331-3.000.
Energy: *See*—
Kupperman, David S.; and Linzer, Melvin, 4,898,034, Cl. 73-644.000.
Porges, Karl G., 4,899,101, Cl. 324-663.000.
Post, Richard F., 4,899,084, Cl. 315-111.810.
Rajan, John B.; Kumar, Romesh; and Vissers, Donald R., 4,898,692, Cl. 252-629.000.
Talanker, Vera; and Greenwald, Martin, 4,899,100, Cl. 324-636.000.
National Aeronautics and Space Administration: *See*—
Berry, Maggie L.; and Berry, Robert F., Jr., 4,899,356, Cl. 378-58.000.
Cheng, Li-Jen; Gheen, Gregory O.; and Partovi, Afshin, 4,898,436, Cl. 350-3.640.
Kahn, Jon B., 4,898,348, Cl. 244-161.000.
U.S. Philips Corporation: *See*—
Einhaus, Hermanus F., 4,899,330, Cl. 369-289.000.
Goldmann, Peter; Habelt, Gerhard; and Weihs, Hans, 4,899,035, Cl. 235-441.000.
Kamp, Ronald P. T.; and De Meij, Johannes P., 4,899,025, Cl. 219-10.570.
Klose, Hans-Peter; Konig, Kurt; and Schwartz, Wolfgang, 4,899,068, Cl. 307-494.000.
Schrammek, Manfred F. L.; and Sprengart, Mathias, 4,899,260, Cl. 362-32.000.
Sleegers, Franciscus T.; Schuitmaker, Pieter D.; and Janssen, Peter J. M., 4,899,329, Cl. 369-275.000.
Stormberg, Hans-Peter; and Watanabe, Yoshio, 4,899,355, Cl. 378-34.000.
Van Gorkum, Aart A.; Beirens, Leopold C. M.; and Vrijssen, Gerardus A. H. M., 4,899,079, Cl. 313-412.000.
Voeten, Hendrik, 4,899,259, Cl. 361-539.000.
Vriens, Leendert; Gerritsen, Gerrit B.; and Van Alphen, Willem M., 4,899,030, Cl. 313-477.00R.
Vroomen, Laurentius C. J.; Van Esdonk, Johannes; Khoe, Giok D.; and Swemmers, Antonius H. M., 4,898,449, Cl. 350-96.210.
United Technologies Corporation: *See*—
Beno, Edward A.; and Noehren, William L., 4,898,515, Cl. 416-134.00A.
Davis, Franklin J.; Wilcox, Gilbert B.; and Wright, Richard R., 4,898,329, Cl. 239-13.000.
McCracken, James R., 4,898,514, Cl. 416-95.000.
Nieter, Jeffrey J.; and DeBlois, Raymond L., 4,898,520, Cl. 418-1.000.
Perkinson, Robert H.; Stearns, Charles F.; and Belanger, Rene F., 4,898,324, Cl. 236-92.00R.
Unitek Corporation: *See*—
Georgakis, Evangelos G., 4,898,276, Cl. 206-369.000.
Unitrode Corporation: *See*—
Neidorff, Robert A., 4,899,064, Cl. 307-261.000.
Universite Laval: *See*—
Cyr, Normand; Tetu, Michel; and Giordano, Vincent, 4,899,345, Cl. 372-32.000.
University of Akron: *See*—
Harwood, H. James; Majumdar, Ramendra N.; and Yang, Shih-Liang, 4,898,915, Cl. 525-326.700.
University of Alabama at Birmingham/Research Foundation, The: *See*—
Urry, Dan W., 4,898,926, Cl. 528-328.000.
University of British Columbia, The: *See*—
Levy, Julia G.; Steele, J. Kevin; and Stammers, Anthea T., 4,898,730, Cl. 424-88.000.
University of California, The Regents of the: *See*—
Pines, Alexander; and Samoson, Ago, 4,899,111, Cl. 324-321.000.
University of Iowa Research Foundation: *See*—
Datta, Ravindra; and Eyman, Darrell P., 4,898,845, Cl. 502-3.000.
University of Minnesota, Regents of the: *See*—
Shur, Michael; and Simmons, John G., 4,899,200, Cl. 357-30.000.
Xu, Jingming; Shur, Michael; and Sweeny, Mark, 4,899,201, Cl. 357-22.000.
University of Pennsylvania, Trustees of the: *See*—
Zemel, Jay N., 4,899,058, Cl. 250-492.100.
University of Strathclyde: *See*—
Nicol, Alexander C., 4,897,927, Cl. 33-534.000.
University of Washington, The Board of Regents of the: *See*—
Shapiro, Bennett M.; Turner, Eric E.; Hopkins, Paul B.; Klevit, Rachel E.; Holler, Tod P.; and Spaltenstein, Andreas, 4,898,878, Cl. 514-386.000.
Unterlass, Josef: *See*—
Schwarzl, Helmut; and Unterlass, Josef, 4,899,032, Cl. 219-375.000.
UOP: *See*—
Clark, Keith R.; and Richman, Philip, 4,899,016, Cl. 585-826.000.
Kalnes, Tom N.; and James, Robert B., Jr., 4,899,001, Cl. 585-310.000.
Sachtler, J. W. Adriann; and Lawson, R. Joe, 4,899,012, Cl. 585-482.000.
Urabe, Hitoshi: *See*—
Tatsumi, Setsuji; Shiota, Kazuo; Urabe, Hitoshi; and Shimazaki, Osamu, 4,899,216, Cl. 358-80.000.
Urata, Chieo, to Kabushiki Kaisha Komatsu Seisakusho. Mold lubricant exhausting apparatus for knocking-out mechanism. 4,898,225, Cl. 164-158.000.
Urban, Franz; and Bauer, Adolf, to Krauss-Maffei AG. Mixing apparatus. 4,898,714, Cl. 422-133.000.
Urry, Dan W., to University of Alabama at Birmingham/Research Foundation, The. Bioelastomer containing tetra/penta-peptide units. 4,898,926, Cl. 528-328.000.
Urso, Charles L. Versatile heater/cooler. 4,898,148, Cl. 126-204.000.
Urushibata, Hiroaki: *See*—
Matsumura, Mitsuie; Tanaka, Toshihide; Urushibata, Hiroaki; and Sato, Kazunao, 4,898,793, Cl. 429-38.000.
Ushio Denki: *See*—
Gotoh, Manabu, 4,899,195, Cl. 355-77.000.

Ushio, Masaru; and Okazaki, Hajime, to Nippon Oil Co., Ltd. Method for dewaxing hydrocarbon oil employing crystalline aluminosilicates promoted with a solid fluorine compound. 4,898,661, Cl. 208-117.000.

Ushiro, Tatsuzo: *See*—
Edakubo, Hiroo; Itani, Takashi; Narasawa, Takashi; Ushiro, Tatsuzo; Watanabe, Hiroshi; and Hasegawa, Masahide, 4,899,236, Cl. 360-95.000.

Uskokovic, Milan R.: *See*—
Baggiolini, Enrico G.; Hennessy, Bernard M.; and Uskokovic, Milan R., 4,898,855, Cl. 514-167.000.

Usuki, Sawako: *See*—
Takewa, Hiroyuki; Serikawa, Mitsuhiko; Ishikawa, Seiichi; Usuki, Sawako; Kimura, Yoichi; and Obata, Shuichi, 4,899,390, Cl. 381-154.000.

Uwaydah, Ibrahim M.: *See*—
Walsh, David A.; and Uwaydah, Ibrahim M., 4,898,874, Cl. 514-379.000.

Vac-Fec Systems, Inc.: *See*—
Randhawa, Harbhajan S., 4,898,768, Cl. 428-216.000.

Vaclavik, Peter, to Siemens Aktiengesellschaft. Circuit arrangement for the connection of line circuits of a digital time multiplex-telephone network. 4,899,379, Cl. 379-377.000.

Valois S.A.: *See*—
Lugez, Pierre, 4,898,638, Cl. 156-272.600.

Van Alphen, Willem M.: *See*—
Vriens, Leendert; Gerritsen, Gerrit B.; and Van Alphen, Willem M., 4,899,080, Cl. 313-477.00R.

Van Den Elst, Frits: *See*—
Van Wechem, Guus; Beunk, Gerrit; Van Den Elst, Frits; and Van Der Ploeg, Arie, 4,898,142, Cl. 123-557.000.

Van Der Ploeg, Arie: *See*—
Van Wechem, Guus; Beunk, Gerrit; Van Den Elst, Frits; and Van Der Ploeg, Arie, 4,898,142, Cl. 123-557.000.

Van Der Steen, Frederick H.: *See*—
Van Koten, Gerard; Van Der Steen, Frederick H.; and Jastrzebski, Johann T. B. H., 4,898,955, Cl. 556-12.000.

van de Wetering, Wietse J., to Heerema Engineering Service BV. Method of handling a load with a crane vessel having movable load supports. 4,898,289, Cl. 212-270.000.

Vanek, Jaroslav. Deep well solar pump. 4,898,519, Cl. 417-379.000.

Van Esdonk, Johannes: *See*—
Vroomen, Laurentius C. J.; Van Esdonk, Johannes; Khoe, Giok D.; and Swemmers, Antonius H. M., 4,898,449, Cl. 350-96.210.

Vangheluwe, Jose: *See*—
Lewyllie, Dirk; Vangheluwe, Jose; Pauwels, Bernard; and Shaw, Henry, 4,898,214, Cl. 139-116.00A.

Van Gorkum, Aart A.; Beirens, Leopold C. M.; and Vrijssen, Gerardus A. H. M., to U.S. Philips Corporation. Cathode ray tube. 4,899,079, Cl. 313-412.000.

Van Hoek, Hendrik C.; and Williams, Daryl N., to Broken Hill Proprietary Company Limited, The. Determining a width and/or thickness of a generally rectangular object. 4,899,061, Cl. 250-560.000.

Van Horn, Wendell E., to QO Chemicals, Inc. Removal of volatile acids from aqueous solutions. 4,898,644, Cl. 203-15.000.

Vanis, Vernon V.: *See*—
Wells, Hoyt M.; Determan, William J.; Vanis, Vernon V.; Hrivnak, John E.; Richeson, Donald E.; and Saupe, Timothy P., 4,898,703, Cl. 264-166.000.

Van Koten, Gerard; Van Der Steen, Frederick H.; and Jastrzebski, Johann T. B. H., to Gist-Brocades N.V. Meta-containing enolate compounds. 4,898,955, Cl. 556-12.000.

Van Landeghem, Marc, to Siemens Aktiengesellschaft. Method for a program-controlled telephone switching system in which performance features relating to the setup of a call connection can be initiated from a subscriber station. 4,899,374, Cl. 379-215.000.

Van Leeuwen, Willem J.: *See*—
Pierce, Richard S.; and Van Leeuwen, Willem J., 4,898,167, Cl. 128-205.160.

Van Steenburg, Kip, to Amatech Corporation. Locking pivot assembly with both pivot and tilt axes. 4,898,491, Cl. 403-96.000.

Van Wechem, Guus; Beunk, Gerrit; Van Den Elst, Frits; and Van Der Ploeg, Arie, to Texas Instruments Incorporated. Combustion engine with fuel injection system, and a spray valve for such an engine. 4,898,142, Cl. 123-557.000.

Vanzura, Jiri : *See*—
Kasafirek, Evzen; Rybak, Miroslav; Krejci, Ivan; Sturc, Antonin; Roubalova, Alena; Vanzura, Jiri ; Krepela, Evzen; and Bartik, Michal, 4,898,930, Cl. 530-332.000.

Vapor Technologies Inc.: *See*—
Pinkhasov, Eduard, 4,898,623, Cl. 148-3.000.

Varian Associates, Inc.: *See*—
Freytsis, Avrum; Hertel, Richard J.; and Mears, Eric L., 4,899,059, Cl. 250-492.200.

Varney, John W. Steam power plant. 4,897,999, Cl. 60-678.000.

Vartan, Robert R., to Beecham Group p.l.c. Process for production of composition containing lecithin and polyvinylpyrrolidone. 4,898,728, Cl. 424-80.000.

Varwig, John W., to Mallinckrodt, Inc. Method of making the ethanolamine salt of N-nitrosophenylhydroxylamine. 4,898,976, Cl. 564-112.000.

Vassiliou, Eustathios, to Du Pont de Nemours, E. I., and Company. Method and apparatus for detecting and eliminating entrapped gas bubbles in a thick film coating. 4,898,020, Cl. 73-19.000.

Vaught, John L.; Neukermans, Armand P.; Keldermann, Herman F.; and Koenig, Franklin R., to Tencor Instruments. Particle detection on patterned wafers and the like. 4,898,471, Cl. 356-394.000.

VDO Adolf Schindling AG: *See*—
Rossberg, Rainer, 4,899,130, Cl. 340-438.000.
Schurig, Dieter, 4,898,791, Cl. 428-629.000.

Velde, Vincent V.: *See*—
Lavie, David; Revel, Michel; Rotman, Dalia; and Velde, Vincent V., 4,898,891, Cl. 514-732.000.

Ventress, Ray. Strut straightening device. 4,898,018, Cl. 72-457.000.

Ventura Forge, Inc.: *See*—
Brooker, Dennis B., 4,897,922, Cl. 30-166.000.

Veretenov, Lev N.: *See*—
Gorodissky, Boris P.; Lotts, Jury A.; and Veretenov, Lev N., 4,898,262, Cl. 184-6.400.

Verhey, Robert P.: *See*—
Meijer, Roelf J.; and Verhey, Robert P., 4,897,997, Cl. 60-517.000.

Vermaat, David L., to Imagitek, Inc. Intermittent drive mechanism for copy stacking. 4,898,374, Cl. 271-178.000.

Vernerey, Jean-Claude, to Societe de Prospection et D'Inventions Techniques (S.P.I.T.). Ejector sealing apparatus. 4,898,315, Cl. 227-10.000.

Vernon E. Faulconer, Inc.: *See*—
Enright, David J., 4,898,235, Cl. 166-64.000.

VerWeyst, Gordon E.; Burk, Charles E.; and Pherigo, Douglas E., to J. L. Clark, Inc. Container closure with hinged flap. 4,898,292, Cl. 215-237.000.

Vetter, Ulrich, to Schaudt Maschinenbau GmbH. Grinding machine with dressing apparatus and method of dressing grinding wheels therein. 4,897,964, Cl. 51-5.00D.

Victor Company of Japan, Ltd.: *See*—
Yoshida, Shiro, 4,899,233, Cl. 360-77.140.

Vidal, Claude A.: *See*—
Borsanyi, Alexander S.; Redmond, Russell J.; Vidal, Claude A.; and Spaeth, Edmund E., 4,898,584, Cl. 604-153.000.

Videocolor: *See*—
Cote, Daniel, 4,898,559, Cl. 445-64.000.

Vidil, F. Ronald: *See*—
Ginzburg, Vladimir B.; and Vidil, F. Ronald, 4,898,014, Cl. 72-247.000.

Viemeister, Tucker: *See*—
Krohn, Lisa; and Viemeister, Tucker, 4,899,368, Cl. 379-67.000.

Vietmeier, Juergen; Pfoehler, Peter; Brauch, Gundo; Druschke, Wolfgang; and Zosel, Albrecht, to BASF Aktiengesellschaft. Aqueous polyacrylate dispersions and their use for the production of self-adhesive structures having good low temperature adhesion. 4,898,909, Cl. 524-820.000.

Vig, John R., to United States of America, Army. High accuracy frequency standard and clock system. 4,899,117, Cl. 331-3.000.

Villman, Glenda S.: *See*—
Jang, Yue-Teh; Liebmann, Vern L.; Villman, Glenda S.; and Amin, Surendra A., 4,898,591, Cl. 604-282.000.

Vinatier, Claude J.: *See*—
Bayetto, Jean-Christophe M.; and Vinatier, Claude J., 4,899,162, Cl. 343-700.0MS.

Vingler, Philippe: *See*—
Maignan, Jean; Lang, Gerard; Malle, Gerard; and Vingler, Philippe, 4,898,864, Cl. 514-237.500.

Vissers, Donald R.: *See*—
Rajan, John B.; Kumar, Romesh; and Vissers, Donald R., 4,898,692, Cl. 252-629.000.

Viswanathan, Ravi: *See*—
DePrince, Randolph B.; and Viswanathan, Ravi, 4,898,733, Cl. 424-425.000.

Vitamins, Inc.: *See*—
Rice, Wayne K.; and Singh, Laxman, 4,898,673, Cl. 210-634.000.

Voeten, Hendrik, to U.S. Philips Corporation. Encased electric component. 4,899,259, Cl. 361-539.000.

Voigt, Hartmut; and Freudenreich, Reinhold, to Hoechst Aktiengesellschaft. Process for the production of pure tetrafluoroethylene. 4,898,645, Cl. 203-67.000.

Voitik, Robert M., to Falex Corporation. Creep seal for rotating shaft. 4,898,394, Cl. 277-35.000.

Voles, Roger, to Thorn EMI Electronics Limited. Rate sensor. 4,898,032, Cl. 73-505.000.

Volkert, Wynn A.: *See*—
Simon, Jaime; Wilson, David A.; Volkert, Wynn A.; Troutner, David E.; and Goeckeler, William F., 4,898,724, Cl. 424-1.100.

von Ballmoos, Roland: *See*—
Derouane, Eric G.; and von Ballmoos, Roland, 4,898,722, Cl. 423-328.000.

VonHayn, Holger; and Maas, Joachim, to Alfred Teves GmbH. Valve block assembly. 4,898,360, Cl. 251-129.010.

Vowles, Robert W.: *See*—
Barry, Peter L.; and Vowles, Robert W., 4,898,197, Cl. 134-8.000.

Vriens, Leendert; Gerritsen, Gerrit B.; and Van Alphen, Willem M., to U.S. Philips Corporation. Projection television display tube with cooling means and display device having such a display tube. 4,899,080, Cl. 313-477.00R.

Vrijssen, Gerardus A. H. M.: *See*—
Van Gorkum, Aart A.; Beirens, Leopold C. M.; and Vrijssen, Gerardus A. H. M., 4,899,079, Cl. 313-412.000.

Vroomen, Laurentius C. J.; Van Esdonk, Johannes; Khoe, Giok D.; and Swemmers, Antonius H. M., to U.S. Philips Corp. Connector for the detachable connection of light conducting fibres. 4,898,449, Cl. 350-96.210.

Vuletic, Bogdan, to Deutsche Voest-Alpine Industrieanlagenbau GmbH. Apparatus for charging a melting gasifier with gasification media and sponge iron. 4,898,366, Cl. 266-160.000.

Vyzkumny Ustav Makromolekularni Chemie: *See*—
Salajka, Zdenek; Hamrik, Odlrich; Kratochvila, Jan; Gheorghiu, Mihnea; Krivanek, Josef; Sindelar, Pavel; Zaloudik, Petr; Legeza, Vasil; and Jansa, Ladislav, 4,898,847, Cl. 522-110.000.

W. R. Grace & Co.-Conn.: *See*—
Edwards, Grant C.; and Peters, Alan W., 4,898,846, Cl. 502-67.000.
Havens, Marvin R., 4,898,771, Cl. 428-316.000.
Lin, You-Jyh; and Kloczewski, Harold, 4,898,988, Cl. 568-386.000.

W. Schlafhorst & Co.: *See*—
Raasch, Hans; and Boker, Reinhard, 4,897,993, Cl. 57-302.000.

Wachter, Michael P.: *See*—
Murray, William V.; and Wachter, Michael P., 4,898,952, Cl. 548-378.000.

Wacks, Kenneth P.: *See*—
MacFadyen, David J.; Edwards, Robert G.; Wacks, Kenneth P.; and Foley, Daniel J., 4,899,129, Cl. 340-310.00R.
MacFadyen, David J.; Edwards, Robert G.; Wacks, Kenneth P.; and Foley, Daniel J., 4,899,217, Cl. 358-86.000.

Wagner, Wilfried: *See*—
Seip, Hermann; Wagner, Wilfried; and Jakobi, Ralf, 4,898,073, Cl. 91-369.200.

Wahi, Ashok L.; and Jakatdar, Priya, to Better Communications, Inc. Multi use telephone extension control circuit and device providing lockout for privacy. 4,899,372, Cl. 379-184.000.

Wakefield Engineering, Inc.: *See*—
Lorenzetti, Victor; and Pontes, Manuel, 4,899,210, Cl. 357-81.000.

Wakita, Haruki: *See*—
Hamada, Mitsuo; Shimizu, Koji; and Wakita, Haruki, 4,898,689, Cl. 252-510.000.

Walcott, Billy D., to Xerox Corporation. Ionographic device with pin array coronode. 4,899,186, Cl. 346-159.000.

Waldecker, Thomas J.; Dewar, Robert; Wybo, David R.; and Woroniec, Richard, to Perceptron, Inc. Vehicle wheel alignment apparatus and method. 4,899,218, Cl. 358-93.000.

Waldock, David B.: *See*—
Hofmann, Robert F.; and Waldock, David B., 4,898,170, Cl. 606-166.000.

Walker, Alan H.: *See*—
Brull, Robert A.; Del Signore, James R., II; and Walker, Alan H., 4,898,487, Cl. 400-354.000.

Walker, Lonnie R.: *See*—
Stegemoeller, Calvin L.; and Walker, Lonnie R., 4,898,473, Cl. 366-132.000.

Walker, Robert A. Air control system for air bed. 4,897,890, Cl. 5-453.000.

Wallace, Elmer E., to SCP, Inc. Low pressure gas regulator. 4,898,204, Cl. 137-505.410.

Wallace, Herbert J.: *See*—
Savoy, Thomas D.; and Wallace, Herbert J., 4,898,104, Cl. 109-1.00R.

Wals, Lourens; and Cooymans, Ludwig P., to Janssen Pharmaceutica N.V. α,α-Diaryl-4-aryl-4-hydroxyl-1-piperidinebutanamide, N-oxides and pharmaceutical use. 4,898,873, Cl. 514-327.000.

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Badger, Rodney S.; Wasicek, Lawrence D.; and Wand, Bruce H., 4,898,577, Cl. 604-53.000.

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Fung, Michael G.; and Wang, Justin, 4,899,272, Cl. 365-230.030.

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Ware, Malcolm S.: *See*—
Crouse, William G.; and Ware, Malcolm S., 4,899,384, Cl. 381-31.000.

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Mathiowitz, Edith; Langer, Robert S.; Warshawsky, Abraham; and Edelman, Elazar, 4,898,734, Cl. 424-426.000.

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Wasser, Barry: *See*—
Morin, Wilfred W., Jr.; and Wasser, Barry, 4,899,161, Cl. 342-451.000.

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Asada, Masanori; Hamaguchi, Shigeki; Katsuki, Hidetoshi; Nakamura, Yoshio; Takahashi, Hideyuki; Takahara, Kenji; Shimada, Yoshio; Ohashi, Takehisa; and Watanabe, Kiyoshi, 4,898,822, Cl. 435-121.000.

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Fujii, Setsuro; Hattori, Eizou; Hirata, Mitsuteru; Watanabe, Koichiro; Onogi, Kazuhiro; and Nagakura, Masahiko, 4,898,876, Cl. 544-391.000.

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Takeya, Noriyoshi; Ishii, Hidehiro; Watanabe, Osamu; Yoshio, Junichi; Katakami, Kazuhiko; and Izumo, Takeshi, 4,899,326, Cl. 369-36.000.

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Iwasa, Hiroki; Watanabe, Toyofumi; and Furuya, Hirohide, 4,898,649, Cl. 204-28.000.

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Yajima, Yasuhito; and Watanabe, Yasushi, 4,898,035, Cl. 73-727.000.

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Stormberg, Hans-Peter; and Watanabe, Yoshio, 4,899,355, Cl. 378-34.000.

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Watson, W. Keith R., 4,898,884, Cl. 514-553.000.

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Weber, Alfred: *See*—
Hempel, Gerhard; Kennecke, Mario; Krieger, Bernhard; Phillippson, Rainer; Triem, Hermann; and Weber, Alfred, 4,898,693, Cl. 260-397.400.

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Manske, Bradley W.; and Weber, John M., 4,898,263, Cl. 187-133.000.

Weber, Karl-Heinz, to Gebr. Eickhoff Maschinenfabrik u. Eisengieberei mbH. Power supply system for an underground mining machine. 4,898,428, Cl. 299-30.000.

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Rayfield, Jerry W.; Baker, Robert; and Weber, Kenneth E., 4,898,620, Cl. 106-464.000.

Wedel, Victor J. Monolithic disposable needle guide for ultrasound transducers. 4,898,178, Cl. 128-662.050.

Wegdell, C. Stefan: *See*—
Chen, Tien-Tsung; Wegdell, C. Stefan; Rutkowski, Wayne L.; and Kao, Kim Y., 4,898,323, Cl. 229-92.300.

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Weihs, Hans: *See*—
Goldmann, Peter; Habelt, Gerhard; and Weihs, Hans, 4,899,035, Cl. 235-441.000.

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Weitemeyer, Christian: *See*—
Priesch, Manfred; Rau, Harald; and Weitemeyer, Christian, 4,898,772, Cl. 428-332.000.

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Slasinski, Arthur L., 4,897,912, Cl. 29-432.200.

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Wells, Peter M.: *See*—
Shely, William W.; and Wells, Peter M., 4,897,899, Cl. 24-16.0PB.

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Hofmann, Hans; and Wendt, Hartmut, 4,898,699, Cl. 264-43.000.

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Schmid, Samuel, 4,898,069, Cl. 89-33.010.

Werner, Wilfried: *See*—
Pfeiffer, Ludwig; and Werner, Wilfried, 4,898,496, Cl. 405-141.000.

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Hirata, Shinji; and Horinishi, Katsumi, 4,899,086, Cl. 315-169.300.

West, John G. W., to Magneti Marelli Electrical Limited. Permanent magnet rotary dynamo electric machines. 4,899,074, Cl. 310-154.000.

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Bonke, Carl, 4,899,351, Cl. 375-108.000.

Western/Scott Fetzer Company: *See*—
Ross, Albert, 4,898,205, Cl. 137-505.120.

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Boothroyd, Edwin J., 4,899,121, Cl. 335-245.000.
Einolf, Charles W., Jr.; Shutterly, Harold B.; Sun, Shan C.; Gonnam, Russel W.; Ray, Roger E.; Koch, Karl C.; and Maynard-Nenno, Pamela M., 4,899,383, Cl. 380-48.000.
Hansen, J. Richard; Asars, Juris A.; and Oates, Robert M., 4,899,044, Cl. 250-227.000.
Leksell, David; and Asars, Juris A., 4,899,184, Cl. 346-155.000.
Singh, Prabhakar; Ruka, Roswell J.; and George, Raymond A., 4,898,792, Cl. 429-19.000.
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Cavagna, Giancarlo A.; Groome, Ernest J.; Murphy, Joseph M.; and Raschella, Domenick L., 4,898,752, Cl. 427-265.000.

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Wheeless, Clifford R., Jr. Newborn anti-theft device. 4,899,134, Cl. 340-573.000.

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Holoubek, George H.; Rhoades, John J.; and Whitaker, George P., 4,898,708, Cl. 264-515.000.

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Ries, Stuart W.; and Shembarger, Irene M., 4,899,264, Cl. 362-92.000.

Whitaker, George P.: *See*—
Holoubek, George H.; Rhoades, John J.; and Whitaker, George P., 4,898,708, Cl. 264-515.000.

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Collins, Imack L., 4,897,923, Cl. 30-276.000.

Whiteing, Roland G. Firearms. 4,897,949, Cl. 42-10.000.

Whitesides, Robert B.: *See*—
McGovern, Thomas; and Whitesides, Robert B., 4,898,234, Cl. 165-170.000.

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Wickmann-Werke GmbH: *See*—
Asdollahi, Norbert; Poerschke, Karl; Stark, Klaus; and Friedrich, Claus, 4,899,123, Cl. 337-273.000.

Wieczerniak, Walter J.: *See*—
Bammel, Brian D.; Wieczerniak, Walter J.; and Snell, Kenneth D., 4,898,652, Cl. 204-44.200.

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Clauss, Allen D.; Culver, Gayle E.; Piatt, David M.; and Wierenga, Thomas J., 4,898,680, Cl. 252-8.800.

Wiese, Paul R.: *See*—
Hinchcliffe, Dennis; Labbe, Francis A. M.; Molins, Desmond W.; and Wiese, Paul R., 4,898,187, Cl. 131-284.000.

Wiggins Teape Group Limited, The: *See*—
Allen, Roger A.; and Youd, Geoffrey, 4,898,037, Cl. 73-866.000.

Wilcox, Gilbert B.: *See*—
Davis, Franklin J.; Wilcox, Gilbert B.; and Wright, Richard R., 4,898,329, Cl. 239-13.000.

Wilcox, Robert C.: *See*—
Stout, Darwin E.; Wilcox, Robert C.; and Peloquin, Charles A., 4,898,274, Cl. 206-289.000.

Wilding, Oliver K., Jr.: *See*—
Dosaj, Vishu D.; Halm, Roland L.; and Wilding, Oliver K., Jr., 4,898,960, Cl. 556-472.000.

Wildmann, Daniel, to Ciba-Geigy AG. Laser layout. 4,899,343, Cl. 372-9.000.

Wilk, Sven T.; and Olsson, John G., to Aktiebologet Electrolux. Local control system for domestic appliances and alarm devices. 4,899,131, Cl. 340-518.000.

Wilkening, Steven R.: *See*—
Artwick, Kert E.; Wilkening, Steven R.; and Pallin, Leslie L., 4,897,975, Cl. 52-208.000.

Willard, Mark L.; Beatty, David E.; and Nyquist, Jeffery A., to Dutchess Bakers' Machinery Company, Inc. Dividing and rounding machine. 4,898,528, Cl. 425-185.000.

William D. Miller, Inc.: *See*—
Miller, William D.; Stiff, Omar L.; and Mercurio, Benardo, 4,897,910, Cl. 29-426.300.

Williams, Barbara L.: *See*—
Williams, Mark F.; and Williams, Barbara L., 4,897,976, Cl. 52-281.000.

Williams, Bruce E., to Minnesota Mining and Manufacturing Company. Process for 6,7-dihydro-5,8-dimethyl-9-fluoro-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid. 4,898,945, Cl. 546-95.000.

Williams, Bruce T.: *See*—
Williams, Robert T., 4,898,319, Cl. 228-219.000.

Williams, Daryl N.: *See*—
Van Hoek, Hendrik C.; and Williams, Daryl N., 4,899,061, Cl. 250-560.000.

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Baker, Malcolm J.; Williams, John G.; and Yates, Graham G., 4,897,986, Cl. 56-13.900.

Williams, Mark F.; and Williams, Barbara L. Building enclosure assemblies. 4,897,976, Cl. 52-281.000.

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Wu, Jeff C.; Cvijanovich, George B.; and Williams, Richard T., 4,898,650, Cl. 204-29.000.

Williams, Robert T., to Williams, Bruce T. Ambient air exclusion system for brazing ovens. 4,898,319, Cl. 228-219.00C

Williius, Jeffrey D. Method for hanging books and book-like items. 4,898,406, Cl. 281-43.000.

Wills, Brian; and Johns, Gary, to Stordy Combustion Engineering Limited. Method of operating a pair of burners and apparatus for use in the method. 4,898,530, Cl. 431-11.000.

Willy Fleischer. *See*—
Pontoppidan, Eskild; and Fleischer, Willy, 4,898,103, Cl. 108-144.000.

Wilson, David A.: *See*—
Simon, Jaime; Wilson, David A.; Volkert, Wynn A.; Troutner, David E.; and Goeckeler, William F., 4,898,724, Cl. 424-1.100.

Wilson, Stephen T.; Lok, Brent M.; and Flanigen, Edith M., to Union Carbide Corporation. Catalytic uses of crystalline metallophosphate compositions. 4,898,660, Cl. 208-114.000.

Wimer, Claude R., Jr.: *See*—
Remington, Robert W., 4,898,310, Cl. 224-238.000.

Winberg, Arvid E.; and Gavriles, James N., to Brunswick Corporation. Water cooled plastic oil pan. 4,898,261, Cl. 184-6.220.

Winkler, Otto, to Balzers Aktiengesellschaft. Thermionic hairpin cathode. 4,899,078, Cl. 313-37.000.

Winsor, Gerald K. Wooden landscaping structures. 4,897,955, Cl. 47-33.000.

Wirtz, John S.: *See*—
Robbins, Daniel H.; Wirtz, John S.; Lein, Juergen; and Brookmire, Michael A., 4,899,214, Cl. 358-75.000.

Wissbrun, Kurt F.: *See*—
Collins, George L.; Wissbrun, Kurt F.; and Kim, Hongkyu, 4,898,925, Cl. 528-230.000.

Wittrisch, Christian, to Institut Francais du Petrole. Probe and its multidirectional anchoring device in a well. 4,898,237, Cl. 166-66.000.

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Wochnowski, Waldemar, to Korber AG. Method of and apparatus for treating uncured tobacco. 4,898,189, Cl. 131-299.000.

Wolff, Erich; Lowski, Dieter; and Elias, Harry, to Agfa-Gevaert Aktiengesellschaft. Color photographic silver halide material with sulfonylphenol oil former. 4,898,811, Cl. 430-546.000.

Wolinski, Leon: *See*—
Melber, George E.; and Wolinski, Leon, 4,898,892, Cl. 521-54.000.
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Wong, Jackson. Double-effect table with heating and cooling purposes. 4,899,027, Cl. 219-10.493.

Wong, Sau-Ching: *See*—
Ou, Jung-Hsing; and Wong, Sau-Ching, 4,899,070, Cl. 307-530.000.
So, Hock-Chuen; and Wong, Sau-Ching, 4,899,067, Cl. 307-465.000.

Wood, Alan G.: *See*—
Corbett, Tim J.; and Wood, Alan G., 4,899,107, Cl. 324-158.00F.

Wood, Johnny D.: *See*—
Bellew, Roy G.; Dunn, Donald P.; Stilwell, Charles T.; and Wood, Johnny D., 4,898,106, Cl. 110-346.000.

Woods, Donald R.: *See*—
Beard, Marian H.; Caro, Perry A.; Hsiao, Jennifer B.; Mackey, Kevin J.; Sandman, James G., Jr.; Steinbach, Gary R.; and Woods, Donald R., 4,899,136, Cl. 340-706.000.

Woodworth, Wesley L. Rear window shade assembly. 4,898,224, Cl. 160-310.000.

Wooster Brush Company, The: *See*—
Barker, Richard L., 4,897,893, Cl. 15-230.110.

Worden, Donald A., to Marotta Scientific Controls, Inc. Jail cell lock mechanism. 4,897,959, Cl. 49-18.000.

Woroniec, Richard: *See*—
Waldecker, Thomas J.; Dewar, Robert; Wybo, David R.; and Woroniec, Richard, 4,899,218, Cl. 358-93.000.

Worthrich, Theodore S., to Surgin Surgical Instrumentation, Inc. Convertible eyeshield. 4,898,162, Cl. 128-155.000.

Wostbrock, Gert: *See*—
Hogenkamp, Wilhelm; and Wostbrock, Gert, 4,897,983, Cl. 53-461.000.

Wright, Bernard S.: *See*—
Hsia, Chung H.; Owen, Hartley; and Wright, Bernard S., 4,898,716, Cl. 422-190.000.
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Wright, John J.: *See*—
Han, William T.; and Wright, John J., 4,898,950, Cl. 548-253.000.

Wright, Oliver; and Janssen, Sylvain, to Schlumberger Industries, S.A. Optical sensor of physical magnitude. 4,899,046, Cl. 250-227.000.

Wright, Richard R.: *See*—
Davis, Franklin J.; Wilcox, Gilbert B.; and Wright, Richard R., 4,898,329, Cl. 239-13.000.

Wright, Stephen: *See*—
Epworth, Richard E.; Wright, Stephen; and Bricheno, Terry, 4,898,443, Cl. 350-96.150.
Wright, Wade S.: *See*—
Block, Wayne F.; Wright, Wade S.; and Klapheke, Chris G., 4,898,628, Cl. 148-111.000.
Wroblewski, Thomas R., to Chrysler Motors Corporation. Electrical device command system, single wire bus and smart octal controller arrangement therefor. 4,899,338, Cl. 370-85.100.
Wu, Jeff C.; Cvijanovich, George B.; and Williams, Richard T., to AMP Incorporated. Laser cleaning of metal stock. 4,898,650, Cl. 204-29.000.
Wuerzer, Bruno: *See*—
Keil, Michael; Jahn, Dieter; Becker, Rainer; Rohr, Wolfgang; and Wuerzer, Bruno, 4,898,610, Cl. 71-121.000.
Wuetig, Fred H. Method and means for sectioning continuously cast billet having a molten core. 4,898,228, Cl. 164-460.000.
Wurster, Fritz W.: *See*—
Broersma, Lester V.; and Wurster, Fritz W., 4,897,888, Cl. 2-421.000.
Wybo, David R.: *See*—
Waldecker, Thomas J.; Dewar, Robert; Wybo, David R.; and Woroniec, Richard, 4,899,218, Cl. 358-93.000.
Wysk, Wolfram: *See*—
Dethlefs, Ralf-Burkhard; Scholz, Bernd; and Wysk, Wolfram, 4,898,773, Cl. 428-332.000.
Xerox Corporation: *See*—
Beard, Marian H.; Caro, Perry A.; Hsiao, Jennifer B.; Mackey, Kevin J.; Sandman, James G., Jr.; Steinbach, Gary R.; and Woods, Donald R., 4,899,136, Cl. 340-706.000.
Brueggemann, Harry P., 4,898,437, Cl. 350-6.700.
Elhatem, Abdul M.; and Buhler, Steven A., 4,899,180, Cl. 346-140.00R.
Hammond, Thomas J.; and Mason, Lawrence J., 4,899,087, Cl. 315-241.00P.
Hawkins, William G.; and Drake, Donald J., 4,899,181, Cl. 346-140.00R.
Hsieh, Bing R.; Gruber, Robert J.; and Haack, John L., 4,898,802, Cl. 430-110.000.
Tellier, Thomas A., 4,899,178, Cl. 346-140.00R.
Walcott, Billy D., 4,899,186, Cl. 346-159.000.
Xu, Jingming; Shur, Michael; and Sweeny, Mark, to University of Minnesota, Regents of the. Electronic and optoelectric devices utilizing light hole properties. 4,899,201, Cl. 357-22.000.
Yabe, Seizo; and Yamazaki, Kunio, to Mitsubishi Gas Chemical Company, Inc. Process for producing molded articles with uneven pattern. 4,898,706, Cl. 264-266.000.
Yabuki, Ritsue: *See*—
Doi, Hidekazu; and Yabuki, Ritsue, 4,898,794, Cl. 429-59.000.
Yajima, Yasuhito; and Watanabe, Yasushi, to NGK Insulators, Ltd. Pressure sensor having sealing member for sealing housing interior with respect to external space. 4,898,035, Cl. 73-727.000.
Yamada, Masaki: *See*—
Odaka, Kentaro; Ozaki, Shinya; Yamada, Masaki; Ishibashi, Hiroshi; and Inazawa, Yoshizumi, 4,899,232, Cl. 360-48.000.
Yamada, Masanori, to Canon Kabushiki Kaisha. Image processing apparatus detecting the size or position of an information portion of an original. 4,899,227, Cl. 358-452.000.
Yamada, Morio; and Kimura, Yoshihiko, to Toyo Seikan Kaisha, Ltd. Apparatus for detecting internal pressure of a can. 4,898,023, Cl. 73-52.000.
Yamada, Shinjiro, to Mitsui Kinzoku Kogyo Kabushiki Kaisha. Watertight, noise-proof sealed type locking apparatus for automobiles. 4,898,414, Cl. 292-337.000.
Yamada, Shozo: *See*—
Torii, Sigeru; Tanaka, Hideo; Tanaka, Motoaki; Yamada, Shozo; and Nakai, Akira, 4,898,939, Cl. 540-310.000.
Yamada, Takeharu, to Sharp Kabushiki Kaisha. Thick film resistor type printed circuit board. 4,899,126, Cl. 338-309.000.
Yamada, Yoshito: *See*—
Yumoto, Hideaki; Yonemura, Masao; Nagase, Mamoru; Yamada, Yoshito; Fujiwara, Yoshiyasu; Okamoto, Masakatsu; and Hosokawa, Yasutoshi, 4,898,022, Cl. 73-46.000.
Yamaga, Mitsuhiro: *See*—
Nakayashiki, Susumu; Kashio, Jiro; Harakawa, Takeshi; Bekki, Yoshinori; and Yamaga, Mitsuhiro, 4,899,142, Cl. 340-825.050.
Yamaguchi, Koichi: *See*—
Kishita, Hirofumi; Yamaguchi, Koichi; and Yoshida, Akira, 4,898,958, Cl. 556-448.000.
Yamaguchi, Syoji: *See*—
Maruyama, Toshio; Oda, Yukio; and Yamaguchi, Syoji, 4,897,967, Cl. 51-165.870.
Yamaha Corporation: *See*—
Iizuka, Akira, 4,898,059, Cl. 84-601.000.
Iwamatsu, Masayuki, 4,899,150, Cl. 341-118.000.
Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Fujita, Minoru; and Shibata, Hirotaka, 4,898,137, Cl. 123-352.000.
Hayata, Osamu, 4,898,508, Cl. 414-476.000.
Kobayashi, Manabu; Suzuki, Kazutoshi; and Kondo, Takeo, 4,898,144, Cl. 123-52.00M.
Yamaichi Electric Mfg. Co., Ltd.: *See*—
Saito, Masaaki, 4,898,540, Cl. 439-153.000.
Yamamoto, Kazuo: *See*—
Igarashi, Tomoharu; Yokote, Yoshiniro; and Yamamoto, Kazuo, 4,898,402, Cl. 280-804.000.
Yamamoto, Masanari; Ito, Yasunobu; and Suzuki, Kenji, to Aisin-Warner Kabushiki Kaisha. Automatic transmission with erroneous shift preventing function. 4,899,278, Cl. 364-424.100.
Yamamoto, Masato, to Omron Tateisi Electronics Co. Electric device with an operation indicating lamp. 4,899,257, Cl. 361-395.000.
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Yamamoto, Saburo: *See*—
Hayakawa, Toshiro; Suyama, Takahiro; Takahashi, Kohsei; Kondo, Masafumi; and Yamamoto, Saburo, 4,899,349, Cl. 372-44.000.
Yamamoto, Tadashi: *See*—
Harada, Toshiaki; Yamamoto, Tadashi; and Takenouchi, Masanori, 4,899,175, Cl. 346-108.000.
Yamamoto, Takehiko; Kubota, Terumasa; Itoh, Isao; Kato, Hiroyuki; Kikuchi, Terumi; Kawasaki, Hiroko; Mashimoto, Misako; and Oki, Yuji, to Tamanoi Vinegar Corporation Limited. Process for producing vinegar from non-cooked alcohol moromi. 4,898,738, Cl. 426-17.000.
Yamamoto, Toshimasa, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Acceleration sensor. 4,898,033, Cl. 73-514.000.
Yamamoto, Yoichi: *See*—
Matsumoto, Junichiro; Shimada, Mitsuhiro; and Yamamoto, Yoichi, 4,898,489, Cl. 400-656.000.
Yamamoto, Yukio: *See*—
Kataoka, Sachiro; Yamamoto, Yukio; and Okai, Saburo, 4,899,083, Cl. 315-77.000.
Yamamura, Kimio: *See*—
Ishimochi, Haruki; Yamamura, Kimio; Fukuyama, Yuji; Yanai, Masato; and Takahashi, Satoshi, 4,899,139, Cl. 340-721.000.
Yamanaka, Hiroshi: *See*—
Yokoi, Takeshi; Nakamura, Shigeo; and Yamanaka, Hiroshi, 4,898,488, Cl. 400-642.000.
Yamanashi, Hideyuki: *See*—
Nagai, Tomoaki; Yamanashi, Hideyuki; and Hachimori, Hideo, 4,898,902, Cl. 524-275.000.
Yamane, Shinichiro: *See*—
Yoshitake, Makoto; Yamane, Shinichiro; and Shirahata, Akihiko, 4,898,959, Cl. 556-466.000.
Yamashita, Hiroshi: *See*—
Sanada, Makoto; Yamashita, Hiroshi; Izawa, Shinichiro; and Hamamoto, Toshikazu, 4,898,131, Cl. 123-90.440.
Yamashita, Tsutomu T.; Shir, Ching-Cheng; Chen, Tu; and Chen, Ga-Lane, to Komag, Inc. Corrosion and wear resistant magnetic disk. 4,898,774, Cl. 428-336.000.
Yamauchi, Toshiyuki: *See*—
Osada, Koji; Date, Haruyuki; Saihara, Yasuhiro; Yamauchi, Toshiyuki; and Koike, Shiro, 4,898,727, Cl. 424-76.100.
Yamazaki, Hiroshi; and Joshi, Sushama. Microorganism immobilization. 4,898,817, Cl. 435-49.000.
Yamazaki, Kunio: *See*—
Yabe, Seizo; and Yamazaki, Kunio, 4,898,706, Cl. 264-266.000.
Yamazaki, Toshiaki: *See*—
Kiyohara, Kazuto; Yamazaki, Toshiaki; Harada, Ichiya; Nakadate, Takanori; Noguchi, Kentaro; Nakano, Michiteru; Sakae, Shigeru; and Okuma, Kazuhiro, 4,898,897, Cl. 523-343.000.
Yan, Tsoung Y., to Mobil Oil Corporation. Process for the selective separation of para-xylene from C8 aromatic mixtures. 4,899,017, Cl. 585-828.000.
Yanagihara, Yasuo: *See*—
Nakai, Satoru; Kaneta, Mayumi; Kikumoto, Yoshikazu; Hong, Yeong-Man; Kawai, Kazuyoshi; Takegata, Setsuko; Ishii, Kiyoshi; Yanagihara, Yasuo; and Hirai, Yoshikatsu, 4,898,818, Cl. 435-69.100.
Yanagita, Tomohiko: *See*—
Aoyagi, Yuuji; Yokoyama, Syouji; and Yanagita, Tomohiko, 4,898,484, Cl. 400-120.000.
Yansi, Masato: *See*—
Ishimochi, Haruki; Yamamura, Kimio; Fukuyama, Yuji; Yanai, Masato; and Takahashi, Satoshi, 4,899,139, Cl. 340-721.000.
Yang, Shih-Liang: *See*—
Harwood, H. James; Majumdar, Ramendra N.; and Yang, Shih-Liang, 4,898,915, Cl. 525-326.700.
Yano, Kazuyuki: *See*—
Kishino, Takao; Katayama, Minoru; Yano, Kazuyuki; and Ohtsuka, Isao, 4,899,081, Cl. 313-496.000.
Yano, Seiki; and Hijikata, Toshiki, to Sharp Kabushiki Kaisha. Optical memory semiconductor laser apparatus. 4,899,359, Cl. 372-44.000.
Yasui, Yoshiyuki: *See*—
Karnopp, Dean C.; and Yasui, Yoshiyuki, 4,898,431, Cl. 303-100.000.
Yasumura, Koichi: *See*—
Fujii, Setsuro; Ishikawa, Hiroshi; Yasumura, Koichi; Jitsukawa, Koichiro; Toyama, Sachio; Tsubouchi, Hidetsugu; Sudo, Kimio; and Tsuji, Kouichi, 4,898,859, Cl. 514-210.000.
Yatagai, Hidetaka: *See*—
Minami, Kenji; Yatagai, Hidetaka; and Sano, Yoshinori, 4,898,788, Cl. 428-481.000.
Yates, Graham G.: *See*—
Baker, Malcolm J.; Williams, John G.; and Yates, Graham G., 4,897,986, Cl. 56-13.900.
Yazaki Corporation: *See*—
Masuda, Takahiro, 4,898,350, Cl. 248-27.100.
Oikawa, Takahiro; Suzuki, Yoshiyuki; and Ohtsuka, Tatsumi, 4,898,031, Cl. 73-505.000.

Yeda Research and Development Company Ltd.: *See*—
Lavie, David; Revel, Michel; Rotman, Dalia; and Velde, Vincent V., 4,898,891, Cl. 514-732.000.
Shapiro, Ehud Y., 4,899,128, Cl. 340-146.200.

Yee, Ying K.: *See*—
Brown, Frederick J.; and Yee, Ying K., 4,898,863, Cl. 514-235.200.

Yeh, Tao-ping, to Ford Aerospace Corporation. Propellant remaining gaging system. 4,898,030, Cl. 73-290.00V.

Yeung, Peter: *See*—
Jannson, Tommasz; Jannson, Joanna; and Yeung, Peter, 4,898,450, Cl. 350-96.210.

Yienger, Robert C.: *See*—
Sanford, Norman R.; Lyons, Bernard J.; and Yienger, Robert C., 4,899,157, Cl. 342-40.000.

Yip, Kin-Fai, to Miles Inc. Crosslinked polyacrylamide-sulfhydryl polymer for immobilization of biologically active substances. 4,898,824, Cl. 435-180.000.

Yissum Research and Development Company of the Hebrew University of Jerusalem: *See*—
Barenholz, Yechezkel; and Gabizon, Alberto, 4,898,735, Cl. 424-450.000.

Yoichi, Matsushita: *See*—
Kazuo, Ogawa; Ichiro, Yamawaki; Yoichi, Matsushita; Naruo, Nomura; and Issei, Okazaki, 4,898,867, Cl. 514-258.000.

Yokobari, Toshio: *See*—
Tachibana, Hidekiyo; Noda, Akihiko; Terao, Kazuo; Honjou, Toshio; Seki, Yukio; Endo, Hiroshi; and Yokobari, Toshio, 4,898,801, Cl. 430-106.600.

Yokohama, Shuichi: *See*—
Isoda, Sumiro; Aibara, Shunzo; Miwa, Tamotsu; Fujiwara, Hiroyuki; Yokohama, Shuichi; and Matsumoto, Hiroo, 4,898,943, Cl. 544-251.000.

Yokoi, Takeshi; Nakamura, Shigeo; and Yamanaka, Hiroshi, to Brother Kogyo Kabushiki Kaisha. Printer with multi-function paper feeding mechanism. 4,898,488, Cl. 400-642.000.

Yokote, Yoshiniro: *See*—
Igarashi, Tomoharu; Yokote, Yoshiniro; and Yamamoto, Kazuo, 4,898,402, Cl. 280-804.000.

Yokoyama, Syouji: *See*—
Aoyagi, Yuuji; Yokoyama, Syouji; and Yanagita, Tomohiko, 4,898,484, Cl. 400-120.000.

Yokoyama, Tetsuo: *See*—
Morishita, Koichi; Yokoyama, Tetsuo; and Sato, Kazuhiro, 4,899,393, Cl. 382-6.000.

Yonemura, Masao: *See*—
Yumoto, Hideaki; Yonemura, Masao; Nagase, Mamoru; Yamada, Yoshito; Fujiwara, Yoshiyasu; Okamoto, Masakatsu; and Hosokawa, Yasutoshi, 4,898,022, Cl. 73-46.000.

Yoon, Hee K.: *See*—
Buese, George J.; and Yoon, Hee K., 4,898,159, Cl. 128-90.000.

Yoshida, Akira: *See*—
Kishita, Hirofumi; Yamaguchi, Koichi; and Yoshida, Akira, 4,898,958, Cl. 556-448.000.

Yoshida, Eiichi: *See*—
Onouchi, Takashi; Sugai, Hironori; Sekiguchi, Kazuo; Hosoda, Yoshikazu; and Yoshida, Eiichi, 4,898,781, Cl. 428-402.220.

Yoshida, Fumiyo: *See*—
Uemura, Toshinobu; Kai, Keiji; Kodani, Masateru; Yoshida, Fumiyo; and Aratani, Matsuhiko, 4,898,937, Cl. 540-227.000.

Yoshida, Masayuki: *See*—
Masaki, Naoki; and Yoshida, Masayuki, 4,899,331, Cl. 369-32.000.

Yoshida, Shiro, to Victor Company of Japan, Ltd. Apparatus for reproducing a magnetically recorded digital signal using a rotary head with automatic track finding signal extraction and selection for tracking control. 4,899,233, Cl. 360-77.140.

Yoshida, Takashi: *See*—
Shibahara, Seiji; Okonogi, Tsuneo; Murai, Yasushi; Kudo, Toshiaki; Yoshida, Takashi; Nishihata, Ken; and Kondo, Shinichi, 4,898,858, Cl. 514-206.000.

Yoshiike, Yoshiji; and Satou, Yoshinori, to Kabushiki Kaisha Toshiba. Rare gas discharge lamp device. 4,899,090, Cl. 315-335.000.

Yoshimura, Tatsushiro; Tomihashi, Nobuyuki; and Simasaki, Shuhei, to Daikin Industries Ltd. Powders of tetrafluoroethylene copolymer and process for preparing the same. 4,898,779, Cl. 428-402.000.

Yoshinari, Osamu; Kawakatsu, Yoshifumi; Takahashi, Hayashi; and Fukuizumi, Hideaki, to Toho Rayon Co., Ltd. Process for producing preoxidized fibers from acrylic fibers. 4,898,700, Cl. 264-83.000.

Yoshio, Junichi: *See*—
Takeya, Noriyoshi; Ishii, Hidehiro; Watanabe, Osamu; Yoshio, Junichi; Katakami, Kazuhiko; and Izumo, Takeshi, 4,899,326, Cl. 369-36.000.

Yoshitake, Makoto; Yamane, Shinichiro; and Shirahata, Akihiko, to Toray Silicone Company, Ltd. Method for the preparation of beta-substituted allylsilane. 4,898,959, Cl. 556-466.000.

Yoshizawa, Toshikazu: *See*—
Fukahori, Yoshihide; Kojima, Hiromu; Ogino, Akihiko; Suzuki, Shigenobu; and Yoshizawa, Toshikazu, 4,899,323, Cl. 367-176.000.

Youd, Geoffrey: *See*—
Allen, Roger A.; and Youd, Geoffrey, 4,898,037, Cl. 73-866.000.

Yozzo, Joseph A.: *See*—
Hawkins, Brian; Greenberg, Jerald; Alon, Ofer; Marten, Victor; Banyai, Edward; Edwards, Jennifer A.; Banyai, David M.; Sanchez, Juan C.; Sitnik, Eran; and Yozzo, Joseph A., 4,898,182, Cl. 128-707.000.

Yu, Michael C.; Scoggins, Lacey E.; and Reed, Jerry O., to Phillips Petroleum Company. Method to modify poly(aryle sulfide) resins. 4,898,904, Cl. 524-399.000.

Yuasa Battery Co., Ltd.: *See*—
Furukawa, Hiroshi; Uemichi, Sachio; Isoi, Toshihiro; and Kawakita, Kenzo, 4,898,796, Cl. 429-178.000.

Yule, Bruce, to Smiths Industries Public Limited Company. Inflation indicators for cuffed tubes. 4,898,168, Cl. 128-207.150.

Yumoto, Hideaki; Yonemura, Masao; Nagase, Mamoru; Yamada, Yoshito; Fujiwara, Yoshiyasu; Okamoto, Masakatsu; and Hosokawa, Yasutoshi, to TLV Co., Ltd. Steam trap operation detector. 4,898,022, Cl. 73-46.000.

Zaloudik, Petr: *See*—
Salajka, Zdenek; Hamrik, Odlrich; Kratochvila, Jan; Gheorghiu, Mihnea; Krivanek, Josef; Sindelar, Pavel; Zaloudik, Petr; Legeza, Vasil; and Jansa, Ladislav, 4,898,847, Cl. 522-110.000.

Zambrano, Raffaele; and Musumeci, Salvatore, to SGS-Thomson Microelectronics S.R.L. Process for forming an integrated circuit on an N type substrate comprising PNP and NPN transistors placed vertically and insulated one from another. 4,898,836, Cl. 437-31.000.

Zamzow, William H.; and Miller, Anthony M., to Kraft, Inc. Method for manufacturing of pasta filata cheese with extended shelf life. 4,898,745, Cl. 426-582.000.

Zapata, Manuel, to Superior Granite & Marble Restoration. Compound and method for polishing stone. 4,898,598, Cl. 51-309.000.

Zbed, Brian D., to Baxter International Inc. Sliding reconstitution device with seal. 4,898,209, Cl. 137-614.040.

Zedalis, Michael S.: *See*—
Gilman, Paul S.; and Zedalis, Michael S., 4,898,612, Cl. 75-249.000.

Zeidler, Siegmund, to Rassmussen GmbH. Coupling for pipes with plain ends. 4,898,407, Cl. 285-328.000.

Zeising, Norbert: *See*—
Behrens, Herbert; and Zeising, Norbert, 4,899,137, Cl. 340-711.000.

Zellweger Uster AG: *See*—
Konrad, Bernhard, 4,899,062, Cl. 307-3.000.

Zembrot, Anton: *See*—
Weisshuhn, Elmer; Bubik, Alfred; Dahl, Hans; Holik, Herbert; Kurtz, Rudiger; Zembrot, Anton; Stotz, Wolf-Gunter; Seider, Werner; and Trondle, Robert, 4,898,643, Cl. 162-259.000.

Zemel, Jay N., to University of Pennsylvania, Trustees of the. Microarchitectural deep well surfaces. 4,899,058, Cl. 250-492.100.

Zengel, Hans: *See*—
Bergfeld, Manfred; Eisenhuth, Ludwig; and Zengel, Hans, 4,898,978, Cl. 564-231.000.

Zerbes, Rudolf: *See*—
Mohrmann, Karl H.; Reiser, Wolf; Linke, Siegfried W.; and Zerbes, Rudolf, 4,898,954, Cl. 549-519.000.

Ziemelis, Maris J.; and Park, William R. R., to Dow Corning Corporation. Method of making hydrophobic copolymers hydrophilic. 4,898,913, Cl. 525-301.000.

Zientek, Horst: *See*—
Riedle, Armin; and Zientek, Horst, 4,898,246, Cl. 169-3...0'0.

Zimmerman, Leon H.: *See*—
Dunaway, Jerry A.; Zimmerman, Leon H.; and LaTondress, Nancy T., 4,898,761, Cl. 428-137.000.

Zinser Textilmaschinen GmbH: *See*—
Rohner, Joschim, deceased; Langen, Manfred; and Gebald, Gregor, 4,897,991, Cl. 57-281.000.

Zivin, Justin A. Reduction of stroke damage. 4,898,869, Cl. 514-280.000.

Zosel, Albrecht: *See*—
Vietmeier, Juergen; Pfoehler, Peter; Brauch, Gundo; Druschke, Wolfgang; and Zosel, Albrecht, 4,898,909, Cl. 524-820.000.

ZTP Coatings: *See*—
Holcombe, Cressie E., Jr.; and Chapman, Lloyd R., 4,898,618, Cl. 106-287.340.

Zuperku, Edward J.: *See*—
Lai, N. C. Joseph; Zuperku, Edward J.; and Henning, Roy A., 4,899,053, Cl. 250-343.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 6TH DAY OF FEBRUARY, 1990

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

American Dental Association Health Foundation: *See*—
Brown, Walter E.; and Chow, Laurence C., Re. 33,161, Cl. 423-308.000.

Bauer, Peter. Fluidic oscillator with resonant inertance and dynamic compliance circuit. Re. 33,159, Cl. 239-589.100.

Bauer, Peter: *See*—
Stouffer, Ronald D.; and Bauer, Peter, Re. 33,158, Cl. 239-589.100.

Bowles Fluidics Corporation: *See*—
Stouffer, Ronald D.; and Bauer, Peter, Re. 33,158, Cl. 239-589.100.

Brown, Walter E.; and Chow, Laurence C., to American Dental Association Health Foundation. Combinations of sparingly soluble calcium phosphates in slurries and pastes as mineralizers and cements. Re. 33,161, Cl. 423-308.000.

Chow, Laurence C.: *See*—
Brown, Walter E.; and Chow, Laurence C., Re. 33,161, Cl. 423-308.000.

Cues, Inc.: *See*—
Guthrie, Kenneth R.; and Martin, James R., Re. 33,160, Cl. 73-40.50R.

Guthrie, Kenneth R.; and Martin, James R., to Cues, Inc. Method and apparatus for inspecting lateral lines. Re. 33,160, Cl. 73-40.50R.

Martin, James R.: *See*—
Guthrie, Kenneth R.; and Martin, James R., Re. 33,160, Cl. 73-40.50R.

Stouffer, Ronald D.; and Bauer, Peter, to Bowles Fluidics Corporation. Fluidic oscillator with resonant inertance and dynamic compliance circuit. Re. 33,158, Cl. 239-589.100.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Burroughs Willcome Co.: *See*—
Cresswell, Ronald M.; Mentha, John W.; and Seaman, Russell L., B1 3,956,327, Cl. 544-325.000.

Cresswell, Ronald M.; Mentha, John W.; and Seaman, Russell L., to Burroughs Willcome Co. Method of preparing 2,4-diamino-5-benzyl pyrimidines. B1 3,956,327, 2-6-90, Cl. 544-325.000.

Day, Allon C.: *See*—
Kyffin, Robin A.; Young, Peter A.; and Day, Allon C., B1 4,728,471, Cl. 264-43.000.

Dean, Mark E., to International Business Machines Corporation. Refresh generator system for a dynamic memory. B1 4,575,826, 2-6-90, Cl. 365-222.000.

International Business Machines Corporation: *See*—
Dean, Mark E., B1 4,575,826, Cl. 365-222.000.

J. W. Greaves & Sons Limited: *See*—
Kyffin, Robin A.; Young, Peter A.; and Day, Allon C., B1 4,728,471, Cl. 264-43.000.

Kyffin, Robin A.; Young, Peter A.; and Day, Allon C., to J. W. Greaves & Sons Limited. Treatment of expansible materials to form lightweight aggregate. B1 4,728,471, 2-6-90, Cl. 264-43.000.

Mentha, John W.: *See*—
Cresswell, Ronald M.; Mentha, John W.; and Seaman, Russell L., B1 3,956,327, Cl. 544-325.000.

Seaman, Russell L.: *See*—
Cresswell, Ronald M.; Mentha, John W.; and Seaman, Russell L., B1 3,956,327, Cl. 544-325.000.

Young, Peter A.: *See*—
Kyffin, Robin A.; Young, Peter A.; and Day, Allon C., B1 4,728,471, Cl. 264-43.000.

LIST OF DESIGN PATENTEES

A.M.S.: *See*—
Geiger, Reinold, 305,871, Cl. D9-435.000.

A/S Jotul: *See*—
Heger, Niels-Erik, 305,928, Cl. D23-350.000.

Akiyama, Akio: *See*—
Wakayama, Shoji; and Akiyama, Akio, 305,902, Cl. D16-133.000.

Aktiebolaget Parts Invent: *See*—
Fasth, Kenneth, 305,899, Cl. D15-141.000.

Almetek Industries, Incorporated: *See*—
Burlando, Albert A., 305,911, Cl. D20-44.000.

Alps Electric Co., Ltd.: *See*—
Fujiwara, Mitsugu, 305,908, Cl. D18-13.000.

Amerock Corporation: *See*—
Clayton, LaVerne E., 305,862, Cl. D8-350.000.
Gresens, Stanley T.; and Green, A. Denton, 305,863, Cl. D8-352.000.

Antonious, Anthony J. Golf club head. 305,921, 2-6-90, Cl. D21-217.000.

Atkins, David, to Australian Telecommunications Corporation. Telephone set. 305,891, 2-6-90, Cl. D14-151.000.

Australian Telecommunications Corporation: *See*—
Atkins, David, 305,891, Cl. D14-151.000.

Bail, Rama N.: *See*—
Whitaker, John B., Jr.; and Bail, Rama N., 305,898, Cl. D15-138.000.

Banjo, Toshinobu; and Onoda, Shigeo, to Mitsubishi Denki Kabushiki Kaisha. Memory card for a computer system. 305,886, 2-6-90, Cl. D14-117.000.

Barkan, Edward D.; Shepard, Howard M.; Gong, Frank; and Krichever, Mark J., to Symbol Technologies, Inc. Hand-held optical scanner. 305,885, 2-6-90, Cl. D14-116.000.

Bellini, Mario, to Ing. C. Olivetti & C., S.p.A. Printing ribbon cartridge. 305,907, 2-6-90, Cl. D18-12.000.

Bergeron, Gregory B., to NOVITAS. Housing for occupancy-activated wall switch or the like. 305,881, 2-6-90, Cl. D13-38.000.

Bevilacqua, Ernest M.; Ehrlich, Nathan; Franks, Anthony D.; Grilk, Henry G.; Li, Wen-Jeng; and Nichols, Arthur B., IV, to Goldstar Products Co., Ltd. Portable radiotelephone unit. 305,888, 2-6-90, Cl. D14-138.000.

Bienenstock, Berta, to Maneuverability, Inc. Desk or similar article. 305,838, 2-6-90, Cl. D6-420.000.

Bisson, Ronald J. Tread and riser stair gauge. 305,873, 2-6-90, Cl. D10-62.000.

Bobowski, Edward: *See*—
Das, Ajit K.; Bobowski, Edward; and Nakazato, Tsuneo, 305,849, Cl. D7-606.000.

Bowman, William R. Book holder. 305,837, 2-6-90, Cl. D6-419.000.

Burlando, Albert A., to Almetek Industries, Incorporated. Tag holder for receiving information pieces. 305,911, 2-6-90, Cl. D20-44.000.

Burton, Michel A., to Intelligent Systems Corporation. Portable computer. 305,883, 2-6-90, Cl. D14-106.000.

Butler, Jean. Doll stand. 305,920, 2-6-90, Cl. D21-189.000.

Butler, Michael J. Bathroom fixture cover. 305,926, 2-6-90, Cl. D23-249.000.

Canon Kabushiki Kaisha: *See*—
Nishimura, Hiroshi, 305,887, Cl. D14-117.000.

Carlson, Arthur R., to Decor Corporation Proprietary Limited, The. Cooler box. 305,851, 2-6-90, Cl. D7-605.000.

Carroll, Thomas M.: *See*—
Peterson, Warren J.; and Carroll, Thomas M., 305,850, Cl. D7-608.000.

Cassai, Gino H.: *See*—
Cassai, Henry J.; and Cassai, Gino H., 305,945, Cl. D28-77.000.
Cassai, Henry J.; and Cassai, Gino H., 305,946, Cl. D28-77.000.

Cassai, Henry J.; and Cassai, Gino H., to Cassai, Henry J. Combined container/bottle and cosmetic wand applicators or the like. 305,945, 2-6-90, Cl. D28-77.000.

Cassai, Henry J.; and Cassai, Gino H., to Cassai, Henry J. Combined container/bottle and cosmetic wand applicators or the like. 305,946, 2-6-90, Cl. D28-77.000.

Chang, Wei-wen. Blanket with pocket. 305,844, 2-6-90, Cl. D6-598.000.

Chevassus, Alain, to LIR. Cosmetic case. 305,947, 2-6-90, Cl. D28-78.000.

Ciavatta, Aldo. Collar for shirts and the like. 305,830, 2-6-90, Cl. D2-602.000.

Clayton, LaVerne E., to Amerock Corporation. Escutcheon. 305,862, 2-6-90, Cl. D8-350.000.

Clement, Richard N.; and Karczmarczyk, Theresa M. Battery heated ice cream scoop. 305,852, 2-6-90, Cl. D7-681.000.

Coca-Cola Company, The: *See*—
Schechter, Alvin H.; and Thompson, Carl R., 305,857, Cl. D7-397.000.

Das, Ajit K.; Bobowski, Edward; and Nakazato, Tsuneo, to Das, Ajit K. Insulating container for water, beverages, and soups. 305,849, 2-6-90, Cl. D7-606.000.

Decor Corporation Proprietary Limited, The: *See*—
Carlson, Arthur R., 305,851, Cl. D7-605.000.

DeFrance, Robert V., to Fargo Manufacturing Company, Inc. Wire gripper. 305,860, 2-6-90, Cl. D8-14.000.

Deguchi, Atsushi: *See*—
Kim, Suk J.; Deguchi, Atsushi; and Yoshinaga, Sadao, 305,910, Cl. D19-42.000.

DeLong, Jeffrey W.: *See*—
Ryan, Thomas J.; and DeLong, Jeffrey W., 305,854, Cl. D7-319.000.

Demarest, Scott W., to S. C. Johnson & Son, Inc. Bait station. 305,924, 2-6-90, Cl. D22-122.000.

DeVito, Joseph, to Plasti-form Enterprises, Inc. Garment hanger. 305,834, 2-6-90, Cl. D6-326.000.

DeVito, Joseph, to Plasti-form Enterprises, Inc. Garment hanger. 305,835, 2-6-90, Cl. D6-326.000.

Drackett Company: *See*—
Perkins, William H., 305,870, Cl. D9-415.000.

Durand, Jean-Jacques. Bowl or similar article. 305,847, 2-6-90, Cl. D7-564.000.

Edson, Sydney: *See*—
Howard, Fred; and Edson, Sydney, 305,839, Cl. D6-462.000.

Ehrlich, Nathan: *See*—
Bevilacqua, Ernest M.; Ehrlich, Nathan; Franks, Anthony D.; Grilk, Henry G.; Li, Wen-Jeng; and Nichols, Arthur B., IV, 305,888, Cl. D14-138.000.

Epoch Company, Ltd.: *See*—
Ukisu, Hiroshi, 305,914, Cl. D21-59.000.

Exhibition Displays Pty. Limited: *See*—
MacQueen, Roderick I., 305,841, Cl. D6-475.000.

Expressions in Wood, Inc.: *See*—
Marqua, Ellen M.; and Marqua, John T., 305,848, Cl. D7-635.000.

Fargo Manufacturing Company, Inc.: *See*—
DeFrance, Robert V., 305,860, Cl. D8-14.000.

Fasth, Kenneth, to Aktiebolaget Parts Invent. Frame member for an industrial platform. 305,899, 2-6-90, Cl. D15-141.000.

Feger, Stephan; Fischer, Walter; Koller, Norbert; and Krautwald, Manfred, to International Business Machines Corporation. Operator's console. 305,909, 2-6-90, Cl. D18-41.000.

Ferco International Usine de Ferrures de Batiment: *See*—
Kautt, Jean-Jacques, 305,861, Cl. D8-330.000.

Ferraro, Robert J.; and Sniezak, Gary A., to Smith & Wesson Corp. Grip for handgun. 305,923, 2-6-90, Cl. D22-104.000.

Fischer, Walter: *See*—
Feger, Stephan; Fischer, Walter; Koller, Norbert; and Krautwald, Manfred, 305,909, Cl. D18-41.000.

Flowers, Joyce D. Pocketted apron. 305,827, 2-6-90, Cl. D2-229.000.

Foster, Roger V. Inflatable cushion. 305,845, 2-6-90, Cl. D6-601.000.

Franks, Anthony D.: *See*—
Bevilacqua, Ernest M.; Ehrlich, Nathan; Franks, Anthony D.; Grilk, Henry G.; Li, Wen-Jeng; and Nichols, Arthur B., IV, 305,888, Cl. D14-138.000.

FRED: *See*—
Samuel, Henri, 305,900, Cl. D16-102.000.

Freed, Jerry F., to Rhythm Band, Inc. Speaker cabinet. 305,892, 2-6-90, Cl. D14-213.000.

Fujiwara, Mitsuga, to Alps Electric Co., Ltd. Printer for computer. 305,908, 2-6-90, Cl. D18-13.000.

Fukagawa, Kazumi, to Toyota Jidosha Kabushiki Kaisha. Clearance lamp for an automobile. 305,940, 2-6-90, Cl. D26-28.000.

Fukutaka, Takashi: *See*—
Kato, Hisato; Morita, Shigeru; Sasaki, Keiichi; and Fukutaka, Takashi, 305,894, Cl. D15-23.000.

Gantner, Bruce M.; and Gorentz, Mark, to Webasto Sunroof Inc. Vehicle roof wind deflector. 305,879, 2-6-90, Cl. D12-181.000.

Garcia, Trinidad G. Aerosol spray head. 305,872, 2-6-90, Cl. D9-448.000.

Geiger, Reinold, to A.M.S. Bottle cap. 305,871, 2-6-90, Cl. D9-435.000.

Genesco Inc.: *See*—
Whatley, Ian H., 305,828, Cl. D2-314.000.

Gewinner, Marcus N. Headstone floral holder. 305,876, 2-6-90, Cl. D11-147.000.

Goldstar Products Co., Ltd.: *See*—
Bevilacqua, Ernest M.; Ehrlich, Nathan; Franks, Anthony D.; Grilk, Henry G.; Li, Wen-Jeng; and Nichols, Arthur B., IV, 305,888, Cl. D14-138.000.

Gollon, Peter J.; and Teper, Ira. Package of self-adhesive labels. 305,869, 2-6-90, Cl. D9-341.000.

Gong, Frank: *See*—
Barkan, Edward D.; Shepard, Howard M.; Gong, Frank; and Krichever, Mark J., 305,885, Cl. D14-116.000.

Gorentz, Mark: *See*—
Gantner, Bruce M.; and Gorentz, Mark, 305,879, Cl. D12-181.000.

Green, A. Denton: *See*—
Gresens, Stanley T.; and Green, A. Denton, 305,863, Cl. D8-352.000.

Gresens, Stanley T.; and Green, A. Denton, to Amerock Corporation. Back plate. 305,863, 2-6-90, Cl. D8-352.000.

Griffith, Walter L. Cereal bowl with insert. 305,846, 2-6-90, Cl. D7-555.000.

Grilk, Henry G.: *See*—
Bevilacqua, Ernest M.; Ehrlich, Nathan; Franks, Anthony D.; Grilk, Henry G.; Li, Wen-Jeng; and Nichols, Arthur B., IV, 305,888, Cl. D14-138.000.

Hackworth, Robb E. Toy rocking horse. 305,915, 2-6-90, Cl. D21-75.000.

Hall, John W. Tuner for a guitar pickup. 305,905, 2-6-90, Cl. D17-99.000.

Hara, Hisao; and Nakanishi, Akira, to Toyota Jidosha Kabushiki Kaisha. Rear combination lamp for an automobile. 305,941, 2-6-90, Cl. D26-35.000.

Hastings, Malcolm; and Lang, John, to Hozelock-ASL Limited. Lawn sprinkler. 305,925, 2-6-90, Cl. D23-216.000.

Haukvik, Ola; and Lunde, Martin, to J. E. Ekornes A/S. Adjustable seat and backrest unit for a swivel chair. 305,843, 2-6-90, Cl. D6-502.000.

Hegedus, Peter. Set of game straws. 305,913, 2-6-90, Cl. D21-51.000.

Heger, Niels-Erik, to A/S Jotul. Fire place. 305,928, 2-6-90, Cl. D23-350.000.

Herr, Theodore W. Table or similar article. 305,842, 2-6-90, Cl. D6-480.000.

Hida, Shinkichi: *See*—
Ikeda, Hideyuki; Hida, Shinkichi; and Kitagawa, Toshinori, 305,929, Cl. D23-364.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Ito, Jun; and Yamaguchi, Takeshi, 305,880, Cl. D13-2.000.

Howard, Fred; and Edson, Sydney, to Sara Lee Corporation. Merchandising display frame. 305,839, 2-6-90, Cl. D6-462.000.

Hozelock-ASL Limited: *See*—
Hastings, Malcolm; and Lang, John, 305,925, Cl. D23-216.000.

Ikeda, Hideyuki; Hida, Shinkichi; and Kitagawa, Toshinori, to Mitsubishi Denki Kabushiki Kaisha. Air cleaner. 305,929, 2-6-90, Cl. D23-364.000.

Ing. C. Olivetti & C., S.p.A.: *See*—
Bellini, Mario, 305,907, Cl. D18-12.000.

Intelligent Systems Corporation: *See*—
Burton, Michel A., 305,883, Cl. D14-106.000.

International Business Machines Corporation: *See*—
Feger, Stephan; Fischer, Walter; Koller, Norbert; and Krautwald, Manfred, 305,909, Cl. D18-41.000.

Ishida, Kimikazu; and Ishida, Tsuneo, to Saboten Co., Ltd. Pruning shears. 305,858, 2-6-90, Cl. D8-5.000.

Ishida, Tsuneo: *See*—
Ishida, Kimikazu; and Ishida, Tsuneo, 305,858, Cl. D8-5.000.

Ito, Jun; and Yamaguchi, Takeshi, to Honda Giken Kogyo Kabushiki Kaisha. Power generator. 305,880, 2-6-90, Cl. D13-2.000.

Iwagami, Hiroshi, to Toyota Jidosha Kabushiki Kaisha. Clearance lamp for an automobile. 305,939, 2-6-90, Cl. D26-28.000.

Iwahashi, Wataru, to Sharp Corporation. Microwave oven. 305,856, 2-6-90, Cl. D7-351.000.

J. E. Ekornes A/S: *See*—
Haukvik, Ola; and Lunde, Martin, 305,843, Cl. D6-502.000.

J. E. Morgan Knitting Mills, Inc.: *See*—
Kemp, Philip, 305,866, Cl. D9-311.000.

Jackson, Linda J. Body jewelry. 305,874, 2-6-90, Cl. D11-1.000.

Jonsson, Karl-Erik. Debarking tool. 305,895, 2-6-90, Cl. D15-29.000.

Karczmarczyk, Theresa M.: *See*—
Clement, Richard N.; and Karczmarczyk, Theresa M., 305,852, Cl. D7-681.000.

Kato, Hisato; Morita, Shigeru; Sasaki, Keiichi; and Fukutaka, Takashi, to Kubota, Ltd. Forklift tractor. 305,894, 2-6-90, Cl. D15-23.000.

Kato, Shuzo; and Nakamura, Yasushi, to NCR Corporation. Card reader or similar article. 305,882, 2-6-90, Cl. D14-105.000.

Kautt, Jean-Jacques, to Ferco International Usine de Ferrures de Batiment. Lock with digital control. 305,861, 2-6-90, Cl. D8-330.000.

Kawada, Hiroyuki, to Sugiyasu Industries Co., Ltd. Lift for moving a container with castors. 305,949, 2-6-90, Cl. D34-31.000.

Kemp, Philip, to J. E. Morgan Knitting Mills, Inc. Container for undergarments. 305,866, 2-6-90, Cl. D9-311.000.

Kershaw Manufacturing Company, Inc.: *See*—
Whitaker, John B., Jr.; and Bail, Rama N., 305,898, Cl. D15-138.000.

Kim, Suk J.; Deguchi, Atsushi; and Yoshinaga, Sadao, to Yoshinaga Prince Company Limited. Ball-point pen. 305,910, 2-6-90, Cl. D19-42.000.
Kitagawa, Toshinori: *See*—
Ikeda, Hideyuki; Hida, Shinkichi; and Kitagawa, Toshinori, 305,929, Cl. D23-364.000.
Koller, Norbert: *See*—
Feger, Stephan; Fischer, Walter; Koller, Norbert; and Krautwald, Manfred, 305,909, Cl. D18-41.000.
Koves, Thomas. Combined easel and carrier for artists' canvasses or the like. 305,833, 2-6-90, Cl. D6-312.000.
Krautwald, Manfred: *See*—
Feger, Stephan; Fischer, Walter; Koller, Norbert; and Krautwald, Manfred, 305,909, Cl. D18-41.000.
Krichever, Mark; and Metlitsky, Boris, to Symbol Technologies, Inc. Hand-held laser scanning terminal. 305,884, 2-6-90, Cl. D14-116.000.
Krichever, Mark J.: *See*—
Barkan, Edward D.; Shepard, Howard M.; Gong, Frank; and Krichever, Mark J., 305,885, Cl. D14-116.000.
Kubota, Ltd.: *See*—
Kato, Hisato; Morita, Shigeru; Sasaki, Keiichi; and Fukutaka, Takashi, 305,894, Cl. D15-23.000.
Lang, John: *See*—
Hastings, Malcolm; and Lang, John, 305,925, Cl. D23-216.000.
Langford, Stanmore G., III. Body shirt. 305,826, 2-6-90, Cl. D2-211.000.
Les Produits Associes LPA-Broxo S.A.: *See*—
Moret, Michel A., 305,867, Cl. D9-337.000.
Li, Wen-Jeng: *See*—
Bevilacqua, Ernest M.; Ehrlich, Nathan; Franks, Anthony D.; Grilk, Henry G.; Li, Wen-Jeng; and Nichols, Arthur B., IV, 305,888, Cl. D14-138.000.
Linderman, Ray D.; and Williams, Peter C., to Whitey Co. Nut lock plate. 305,927, 2-6-90, Cl. D23-249.000.
LIR: *See*—
Chevassus, Alain, 305,947, Cl. D28-78.000.
Lowell Shoe, Inc.: *See*—
Violi, Dominick, Jr., 305,829, Cl. D2-320.000.
Lunde, Martin: *See*—
Haukvik, Ola; and Lunde, Martin, 305,843, Cl. D6-502.000.
MacAleese, George K., to Majco Building Specialties, L.P. Fireplace mantle. 305,930, 2-6-90, Cl. D23-404.000.
MacAleese, George K., to Majco Building Specialties, L.P. Fireplace mantle. 305,931, 2-6-90, Cl. D23-404.000.
MacQueen, Roderick I., to Exhibition Displays Pty. Limited. Display tray for packages of toothbrush. 305,841, 2-6-90, Cl. D6-475.000.
Mahoney, Timothy S.: *See*—
Sigalov, Lenny; and Mahoney, Timothy S., 305,936, Cl. D25-11.000.
Maia, Ronaldo, to Ronaldo Maia Ltd. Stand for floral container or the like. 305,836, 2-6-90, Cl. D6-405.000.
Majco Building Specialties, L.P.: *See*—
MacAleese, George K., 305,930, Cl. D23-404.000.
MacAleese, George K., 305,931, Cl. D23-404.000.
Maloney, Michael O. Speaker enclosure. 305,893, 2-6-90, Cl. D14-215.000.
Mandat, Howard R. Nachos vending unit. 305,855, 2-6-90, Cl. D7-323.000.
Maneuverability, Inc.: *See*—
Bienenstock, Berta, 305,838, Cl. D6-420.000.
Marqua, Ellen M.; and Marqua, John T., to Expressions in Wood, Inc. Drinking straw dispensing container. 305,848, 2-6-90, Cl. D7-635.000.
Marqua, John T.: *See*—
Marqua, Ellen M.; and Marqua, John T., 305,848, Cl. D7-635.000.
Matsumoto, Nobuki, to Ricoh Company, Ltd. Overhead projector. 305,904, 2-6-90, Cl. D16-232.000.
Mellott, Lela. Curling iron holder. 305,944, 2-6-90, Cl. D28-38.000.
Mepham, Edward J. Shelf unit. 305,840, 2-6-90, Cl. D6-474.000.
Mercado, Armando L. Tennis racquet. 305,922, 2-6-90, Cl. D21-212.000.
Metlitsky, Boris: *See*—
Krichever, Mark; and Metlitsky, Boris, 305,884, Cl. D14-116.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Banjo, Toshinobu; and Onoda, Shigeo, 305,886, Cl. D14-117.000.
Ikeda, Hideyuki; Hida, Shinkichi; and Kitagawa, Toshinori, 305,929, Cl. D23-364.000.
Miyamoto, Kouichi, to Ryobi Ltd. Woodworking router. 305,896, 2-6-90, Cl. D15-127.000.
Moret, Michel A., to Les Produits Associes LPA-Broxo S.A. Bottle and sliding guide assembly or similar article. 305,867, 2-6-90, Cl. D9-337.000.
Morita, Shigeru: *See*—
Kato, Hisato; Morita, Shigeru; Sasaki, Keiichi; and Fukutaka, Takashi, 305,894, Cl. D15-23.000.
Morritt, Kenneth, executor: *See*—
Morritt, Kenneth P., deceased; Morritt, Kenneth, executor; and Morritt, Robin, executor, 305,875, Cl. D11-143.000.
Morritt, Kenneth P., deceased; Morritt, Kenneth, executor; and Morritt, Robin, executor, to Rokes Limited. Plant holder. 305,875, 2-6-90, Cl. D11-143.000.
Morritt, Robin, executor: *See*—
Morritt, Kenneth P., deceased; Morritt, Kenneth, executor; and Morritt, Robin, executor, 305,875, Cl. D11-143.000.
Nagai, Yawara; Yoshinari, Shigeru; and Ushikubo, Masao, to Olympus Optical Co., Ltd. Indicator for a blood analyzer. 305,932, 2-6-90, Cl. D24-1.100.
Nakamura, Yasushi: *See*—
Kato, Shuzo; and Nakamura, Yasushi, 305,882, Cl. D14-105.000.
Nakanishi, Akira: *See*—
Hara, Hisao; and Nakanishi, Akira, 305,941, Cl. D26-35.000.
Nakazato, Tsuneo: *See*—
Das, Ajit K.; Bobowski, Edward; and Nakazato, Tsuneo, 305,849, Cl. D7-606.000.
NCR Corporation: *See*—
Kato, Shuzo; and Nakamura, Yasushi, 305,882, Cl. D14-105.000.
Nichols, Arthur B., IV: *See*—
Bevilacqua, Ernest M.; Ehrlich, Nathan; Franks, Anthony D.; Grilk, Henry G.; Li, Wen-Jeng; and Nichols, Arthur B., IV, 305,888, Cl. D14-138.000.
Nishimura, Hiroshi, to Canon Kabushiki Kaisha. Optically stored data card. 305,887, 2-6-90, Cl. D14-117.000.
Northern Telecom Limited: *See*—
Read, Clifford D., 305,890, Cl. D14-146.000.
NOVITAS: *See*—
Bergeron, Gregory B., 305,881, Cl. D13-38.000.
Olympus Optical Co., Ltd.: *See*—
Nagai, Yawara; Yoshinari, Shigeru; and Ushikubo, Masao, 305,932, Cl. D24-1.100.
Onoda, Shigeo: *See*—
Banjo, Toshinobu; and Onoda, Shigeo, 305,886, Cl. D14-117.000.
Ossip-Klein, Andrew. Diffuser for a wall mounted light fixture. 305,943, 2-6-90, Cl. D26-118.000.
Pence, Gary L. Dual jewelry box. 305,832, 2-6-90, Cl. D3-75.000.
Perkins, William H., to Drackett Company. Blister enclosure for a display package. 305,870, 2-6-90, Cl. D9-415.000.
Peterson, Warren J.; and Carroll, Thomas M., to River City Drum, Inc. Combination cooler, stool and table. 305,850, 2-6-90, Cl. D7-608.000.
Plasti-form Enterprises, Inc.: *See*—
DeVito, Joseph, 305,834, Cl. D6-326.000.
DeVito, Joseph, 305,835, Cl. D6-326.000.
Plunkett, John; and Shampaine, Martin, to Time Inc., Magazine Company, The. Athletic shoe telephone. 305,889, 2-6-90, Cl. D14-143.000.
Poisson, Renald A. Football gameboard. 305,912, 2-6-90, Cl. D21-29.000.
Price, Bill, II. Amphibious vehicle. 305,877, 2-6-90, Cl. D12-3.000.
Proctor-Silex, Inc.: *See*—
Ryan, Thomas J.; and DeLong, Jeffrey W., 305,854, Cl. D7-319.000.
Read, Clifford D., to Northern Telecom Limited. Housing for an upright telephone base. 305,890, 2-6-90, Cl. D14-146.000.
Reasons, Jimmy L. Lamp base. 305,942, 2-6-90, Cl. D26-93.000.
Rentz, David L., to York Plastics Corporation. Bucket. 305,948, 2-6-90, Cl. D32-53.000.
Rhythm Band, Inc.: *See*—
Freed, Jerry F., 305,892, Cl. D14-213.000.
Ricoh Company, Ltd.: *See*—
Matsumoto, Nobuki, 305,904, Cl. D16-232.000.
Risi, Angelo; and Risi, Antonio, to Rothbury Investments Limited. Modular block. 305,938, 2-6-90, Cl. D25-113.000.
Risi, Antonio: *See*—
Risi, Angelo; and Risi, Antonio, 305,938, Cl. D25-113.000.
River City Drum, Inc.: *See*—
Peterson, Warren J.; and Carroll, Thomas M., 305,850, Cl. D7-608.000.
Rokes Limited: *See*—
Morritt, Kenneth P., deceased; Morritt, Kenneth, executor; and Morritt, Robin, executor, 305,875, Cl. D11-143.000.
Ronaldo Maia Ltd.: *See*—
Maia, Ronaldo, 305,836, Cl. D6-405.000.
Rothbury Investments Limited: *See*—
Risi, Angelo; and Risi, Antonio, 305,938, Cl. D25-113.000.
Rotpunkt Dr. Anso Zimmermann: *See*—
Zimmermann, Anso, 305,853, Cl. D7-317.000.
Ryan, Thomas J.; and DeLong, Jeffrey W., to Proctor-Silex, Inc. Carafe. 305,854, 2-6-90, Cl. D7-319.000.
Ryobi Ltd.: *See*—
Miyamoto, Kouichi, 305,896, Cl. D15-127.000.
S. C. Johnson & Son, Inc.: *See*—
Demarest, Scott W., 305,924, Cl. D22-122.000.
Saboten Co., Ltd.: *See*—
Ishida, Kimikazu; and Ishida, Tsuneo, 305,858, Cl. D8-5.000.
Saimen, Tadahiko: *See*—
Takahisa, Yubisui; Sakaguchi, Hiroshi; and Saimen, Tadahiko, 305,906, Cl. D18-2.000.
Sakaguchi, Hiroshi: *See*—
Takahisa, Yubisui; Sakaguchi, Hiroshi; and Saimen, Tadahiko, 305,906, Cl. D18-2.000.
Samuel, Henri, to FRED. Pair of eyeglasses. 305,900, 2-6-90, Cl. D16-102.000.
Sara Lee Corporation: *See*—
Howard, Fred; and Edson, Sydney, 305,839, Cl. D6-462.000.
Sasaki, Keiichi: *See*—
Kato, Hisato; Morita, Shigeru; Sasaki, Keiichi; and Fukutaka, Takashi, 305,894, Cl. D15-23.000.
Schechter, Alvin H.; and Thompson, Carl R., to Coca-Cola Company, The. Tower for a beverage dispenser. 305,857, 2-6-90, Cl. D7-397.000.
Schildge, Adam T., Jr. Opposed tower cable stay supported roof structure. 305,937, 2-6-90, Cl. D25-56.000.
Schneider, Victor L. Combined rollable vehicle cabinet and support rails therefore. 305,878, 2-6-90, Cl. D12-157.000.

Schuss, Werner: *See*—
Straihammer, Reinhard; and Schuss, Werner, 305,935, Cl. D24-12.000.
Shampaine, Martin: *See*—
Plunkett, John; and Shampaine, Martin, 305,889, Cl. D14-143.000.
Sharp Corporation: *See*—
Iwahashi, Wataru, 305,856, Cl. D7-351.000.
Takahisa, Yubisui; Sakaguchi, Hiroshi; and Saimen, Tadahiko, 305,906, Cl. D18-2.000.
Shepard, Howard M.: *See*—
Barkan, Edward D.; Shepard, Howard M.; Gong, Frank; and Krichever, Mark J., 305,885, Cl. D14-116.000.
Shibukawa, Daishirou, to Takara. Reconfigurable toy monster. 305,916, 2-6-90, Cl. D21-149.000.
Shibukawa, Daishirou, to Takara Co., Ltd. Reconfigurable toy monster. 305,917, 2-6-90, Cl. D21-149.000.
Shibukawa, Daishirou, to Takara Co., Ltd. Robotic-humanoid toy assembly. 305,918, 2-6-90, Cl. D21-150.000.
Shibukawa, Daishirou, to Takara Co. Ltd. Reconfigurable toy monster. 305,919, 2-6-90, Cl. D21-148.000.
Siemens Aktiengesellschaft: *See*—
Straihammer, Reinhard; and Schuss, Werner, 305,935, Cl. D24-12.000.
Sigalov, Lenny; and Mahoney, Timothy S. Mobile theater. 305,936, 2-6-90, Cl. D25-11.000.
Smith & Wesson Corp.: *See*—
Ferraro, Robert J.; and Sniezak, Gary A., 305,923, Cl. D22-104.000.
Sniezak, Gary A.: *See*—
Ferraro, Robert J.; and Sniezak, Gary A., 305,923, Cl. D22-104.000.
Snoeyenbos, Gordon E., to Vega Enterprises, Inc. Table saw stock feeder. 305,897, 2-6-90, Cl. D15-133.000.
Sone, Yoshihisa, to Terumo Kabushiki Kaisha. Filter for treating blood. 305,934, 2-6-90, Cl. D24-21.000.
Sony Kabushiki Kaisha: *See*—
Sumita, Kaoru, 305,903, Cl. D16-202.000.
Straihammer, Reinhard; and Schuss, Werner, to Siemens Aktiengesellschaft. Dental handpiece. 305,935, 2-6-90, Cl. D24-12.000.
Sugiyasu Industries Co., Ltd.: *See*—
Kawada, Hiroyuki, 305,949, Cl. D34-31.000.
Sumita, Kaoru, to Sony Kabushiki Kaisha. Video camera combined with video tape recorder. 305,903, 2-6-90, Cl. D16-202.000.
Sun, Jam. Connector for folding crates. 305,864, 2-6-90, Cl. D8-382.000.
Symbol Technologies, Inc.: *See*—
Barkan, Edward D.; Shepard, Howard M.; Gong, Frank; and Krichever, Mark J., 305,885, Cl. D14-116.000.
Krichever, Mark; and Metlitsky, Boris, 305,884, Cl. D14-116.000.
Takahisa, Yubisui; Sakaguchi, Hiroshi; and Saimen, Tadahiko, to Sharp Corporation. Electronic calculator with radio. 305,906, 2-6-90, Cl. D18-2.000.
Takara: *See*—
Shibukawa, Daishirou, 305,916, Cl. D21-149.000.
Takara Co., Ltd.: *See*—
Shibukawa, Daishirou, 305,917, Cl. D21-149.000.
Shibukawa, Daishirou, 305,918, Cl. D21-150.000.
Shibukawa, Daishirou, 305,919, Cl. D21-148.000.
Tenore, Frederick A. Fisherman's vest. 305,825, 2-6-90, Cl. D2-187.000.
Teper, Ira: *See*—
Gollon, Peter J.; and Teper, Ira, 305,869, Cl. D9-341.000.
Terumo Kabushiki Kaisha: *See*—
Sone, Yoshihisa, 305,934, Cl. D24-21.000.
Thompson, Carl R.: *See*—
Schechter, Alvin H.; and Thompson, Carl R., 305,857, Cl. D7-397.000.
Thompson, Richard K., Jr. Orthodontic elastic application tool. 305,933, 2-6-90, Cl. D24-10.000.
Time Inc., Magazine Company, The: *See*—
Plunkett, John; and Shampaine, Martin, 305,889, Cl. D14-143.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Fukagawa, Kazumi, 305,940, Cl. D26-28.000.
Hara, Hisao; and Nakanishi, Akira, 305,941, Cl. D26-35.000.
Iwagami, Hiroshi, 305,939, Cl. D26-28.000.
Ukisu, Hiroshi, to Epoch Company, Ltd. Combined simulative toy pen box and pens. 305,914, 2-6-90, Cl. D21-59.000.
Ushikubo, Masao: *See*—
Nagai, Yawara; Yoshinari, Shigeru; and Ushikubo, Masao, 305,932, Cl. D24-1.100.
Vanderhorst, Paul J. Ski equipment carrier. 305,831, 2-6-90, Cl. D3-36.000.
Vega Enterprises, Inc.: *See*—
Snoeyenbos, Gordon E., 305,897, Cl. D15-133.000.
Violi, Dominick, Jr., to Lowell Shoe, Inc. Shoe sole. 305,829, 2-6-90, Cl. D2-320.000.
Wakayama, Shoji; and Akiyama, Akio, to Young Optical Co., Ltd. Opera glasses. 305,902, 2-6-90, Cl. D16-133.000.
Webasto Sunroof Inc.: *See*—
Gantner, Bruce M.; and Gorentz, Mark, 305,879, Cl. D12-181.000.
Westall, Larry O. Combined spray pump dispenser and squeegee for cleaning windshields. 305,868, 2-6-90, Cl. D9-337.000.
Whatley, Ian H., to Genesco Inc. Sport shoe upper. 305,828, 2-6-90, Cl. D2-314.000.
Whitaker, John B., Jr.; and Bail, Rama N., to Kershaw Manufacturing Company, Inc. Cutter chain link and tool holder combination unit. 305,898, 2-6-90, Cl. D15-138.000.
White, Lewis P. Hook used in mooring a boat or similar article. 305,859, 2-6-90, Cl. D8-14.000.
Whitey Co.: *See*—
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Linderman, Ray D.; and Williams, Peter C., 305,927, Cl. D23-249.000.
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Yamaguchi, Takeshi: *See*—
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Yoshinaga Prince Company Limited: *See*—
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Nagai, Yawara; Yoshinari, Shigeru; and Ushikubo, Masao, 305,932, Cl. D24-1.100.
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Wakayama, Shoji; and Akiyama, Akio, 305,902, Cl. D16-133.000.
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Olij, Huibert W., 7,137, Cl. 15.000.
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LIST OF STATUTORY INVENTION REGISTRATIONS

APPLICANTS TO WHOM

STATUTORY INVENTION REGISTRATIONS WERE ISSUED ON THE 6TH DAY OF FEBRUARY, 1990

Adolph, Horst G.: *See*—
Nock, Lori A.; and Adolph, Horst G., H730, Cl. 528-244.000.

Arnold, Fred E.: *See*—
Wallace, J. Shield; and Arnold, Fred E., H728, Cl. 564-309.000.
Wallace, J. Shield; and Arnold, Fred E., H729, Cl. 528-342.000.

Bamberger, Carlos E., to United States of America, Energy. Process for making boron nitride using sodium cyanide and boron. H736, 2-6-90, Cl. 423-290.000.

Bendor, Giora A.: *See*—
Powell, Norman F.; and Bendor, Giora A., H741, Cl. 342-25.000.

Bismark, Otto H., to United States of America, Army. Low current voltage reference. H743, 2-6-90, Cl. 323-313.000.

Bobbs, Bradley L.; and Goldstone, Jeffrey A., to United States of America, Air Force. Two-line phase-matched Raman amplifier. H742, 2-6-90, Cl. 330-4.300.

Caulfield, H. John: *See*—
McManus, J. Barry; Putnam, Roger S.; and Caulfield, H. John, H738, Cl. 350-3.700.

Dunaway, J. C.: *See*—
Jacobs, Paul L.; and Dunaway, J. C., H747, Cl. 60-242.000.

E. R. Squibb & Sons, Inc.: *See*—
Sudilovsky, Abraham, H734, Cl. 514-19.000.

Fuji Photo Film Co., Ltd.: *See*—
Ishizuka, Kimiko; and Seshimoto, Osamu, H745, Cl. 204-418.000.

Gergen, William P.; Lutz, Robert G.; Willis, Carl L.; and Pottick, Lorelle A. Blends of thermoplastic polymers and modified block copolymers. H731, 2-6-90, Cl. 525-92.000.

Goldstone, Jeffrey A.: *See*—
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Iverson, Daniel C., to United States of America, Energy. Porcelain enamel neutron absorbing material. H744, 2-6-90, Cl. 252-478.000.

Jacobs, Paul L.; and Dunaway, J. C., to United States of America, Army. Active control of solid propellant generators using throat modulation techniques and programmable compensation. H747, 2-6-90, Cl. 60-242.000.

Leach, Robert K., to United States of America, Army. Solar reference flight roll position sensor. H746, 2-6-90, Cl. 73-178.00R.

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Meinken, George E.: *See*—
Srivastava, Suresh C.; and Meinken, George E., H735, Cl. 424-1.100.

Nock, Lori A.; and Adolph, Horst G., to United States of America, Navy. Hydroxy-terminated copolyformals of fluorodiols with nitrodiols. H730, 2-6-90, Cl. 528-244.000.

Pottick, Lorelle A.: *See*—
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Putnam, Roger S.: *See*—
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Seshimoto, Osamu: *See*—
Ishizuka, Kimiko; and Seshimoto, Osamu, H745, Cl. 204-418.000.

Shell Oil Company: *See*—
Lutz, Robert G., H732, Cl. 525-471.000.

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Sudilovsky, Abraham, to E. R. Squibb & Sons, Inc. Method for inhibiting onset of or treating migraine headaches employing an ACE inhibitor. H734, 2-6-90, Cl. 514-19.000.

United States of America
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Bobbs, Bradley L.; and Goldstone, Jeffrey A., H742, Cl. 330-4.300.
Powell, Norman F.; and Bendor, Giora A., H741, Cl. 342-25.000.
Wallace, J. Shield; and Arnold, Fred E., H728, Cl. 564-309.000.
Wallace, J. Shield; and Arnold, Fred E., H729, Cl. 528-342.000.

Army: *See*—
Bismark, Otto H., H743, Cl. 323-313.000.
Gutleber, Frank S., H739, Cl. 342-384.000.
Gutleber, Frank S., H740, Cl. 342-384.000.
Jacobs, Paul L.; and Dunaway, J. C., H747, Cl. 60-242.000.
Leach, Robert K., H746, Cl. 73-178.00R.
McManus, J. Barry; Putnam, Roger S.; and Caulfield, H. John, H738, Cl. 350-3.700.

Energy: *See*—
Bamberger, Carlos E., H736, Cl. 423-290.000.
Iverson, Daniel C., H744, Cl. 252-478.000.
Rushford, Michael C., H737, Cl. 350-347.00E.
Srivastava, Suresh C.; and Meinken, George E., H735, Cl. 424-1.100.

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Nock, Lori A.; and Adolph, Horst G., H730, Cl. 528-244.000.

United States: *See*—
West, Jan C., H733, Cl. 434-189.000.

Wallace, J. Shield; and Arnold, Fred E., to United States of America, Air Force. Aryloxy p-benzidine compounds. H728, 2-6-90, Cl. 564-309.000.

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Willis, Carl L.: *See*—
Gergen, William P.; Lutz, Robert G.; Willis, Carl L.; and Pottick, Lorelle A., H731, Cl. 525-92.000.

CLASSIFICATION OF PATENTS

ISSUED FEBRUARY 6, 1990

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

69.5 4,897,885
81 4,897,886
150 4,897,887
421 4,897,888

CLASS 4

607 4,897,889

CLASS 5

453 4,897,890
493 4,897,891

CLASS 8

405 4,898,595
490 4,898,596

CLASS 15

21 C 4,897,892
230.11 4,897,893
365 4,897,894

CLASS 16

20 4,897,895

CLASS 17

74 4,897,896

CLASS 19

114 4,897,897

CLASS 24

3 J 4,897,898
16 PB 4,897,899
543 4,897,900

CLASS 26

33 4,897,901

CLASS 28

166 4,897,902

CLASS 29

25.35 4,897,903
33 K 4,897,904
116.2 4,897,905
426.3 4,897,910
429 4,897,911
432.2 4,897,912
450 4,897,913
602.1 4,897,914
603 4,897,915
609 4,897,916
623.3 4,897,917
830 4,897,918
888.4 4,897,907
890.44 4,897,908
890.9 4,897,906
894.325 4,897,909

CLASS 30

90.4 4,897,920
134 4,897,921
166 4,897,922
276 4,897,923

CLASS 33

2 R 4,897,924
22 4,897,925
203.14 4,897,926
534 4,897,927
4,897,928
559 4,897,929
644 4,897,930
810 4,897,931

CLASS 34

52 4,897,932
58 4,897,933
78 4,897,934

CLASS 36

7.7 4,897,935
30 A 4,897,936
43 4,897,937
88 4,897,938
108 4,897,939
119 4,897,940

CLASS 37

222 4,897,941
244 4,897,942

CLASS 40

158.1 4,897,943
159 4,897,944
331 4,897,945
513 4,897,946
636 4,897,947
661 4,897,948

CLASS 42

10 4,897,949
62 4,897,950
70.06 4,897,951

CLASS 43

21.2 4,897,952
27.4 4,897,954
102 4,897,953

CLASS 47

33 4,897,955
43 4,897,956
58 4,897,957
68 4,897,958

CLASS 49

18 4,897,959
49 4,897,960
141 4,897,961
208 4,897,962
507 4,897,963

CLASS 51

5 D 4,897,964
128 4,897,965
131.3 4,897,966
165.87 4,897,967
298 4,898,597
309 4,898,598
373 4,897,968
418 4,897,969

CLASS 52

4 4,897,970
35 4,897,971
94 4,897,972
102 4,897,973
199 4,897,974
208 4,897,975
281 4,897,976
363 4,897,978
378 4,897,977
643 4,897,979

CLASS 53

128 4,897,980
431 4,897,981
449 4,897,982
461 4,897,983
501 4,897,984
559 4,897,985

CLASS 55

28 4,898,599
222 4,898,600
341 R 4,898,601
359 4,898,602

CLASS 56

13.9 4,897,986
16.7 4,897,987
202 4,897,988

CLASS 57

239 4,897,989
247 4,897,990
281 4,897,991
4,897,992
302 4,897,993

CLASS 60

39.06 4,897,994
221 4,897,995
468 4,897,996
517 4,897,997
614 4,897,998
678 4,897,999
733 4,898,001
740 4,898,000

CLASS 62

48.2 4,898,006
71 4,898,002
115 4,898,005
244 4,898,003
255 4,898,004

CLASS 65

3.13 4,898,603
18.1 4,898,604
113 4,898,605

CLASS 66

185 4,898,007

CLASS 70

56 4,898,008
58 4,898,009
278 4,898,010
379 R 4,898,011

CLASS 71

86 4,898,606
92 4,898,607
94 4,898,608
105 4,898,609
121 4,898,610

CLASS 72

11 4,898,012
165 4,898,013
247 4,898,014
342 4,898,016
389 4,898,015
405 4,898,017
457 4,898,018
461 4,898,019

CLASS 73

19 4,898,020
40.5 R Re.33,160
40.7 4,898,021
46 4,898,022
52 4,898,023
115 4,898,024
117.3 4,898,025
118.1 4,898,026
4,898,027
4,898,084
147 4,898,028
187 4,898,029
290 V 4,898,030
505 4,898,031
4,898,032
514 4,898,033
644 4,898,034
727 4,898,035
861.74 4,898,036
866 4,898,037

CLASS 74

6 4,898,038
4,898,039
15.63 4,898,040
44 4,898,041
68 4,898,042
388 PS 4,898,043
424.6 4,898,044
471 R 4,898,045
502.5 4,898,046
534.2 4,898,047
594.4 4,898,048
594.6 4,898,063
4,898,064
866 4,898,049
867 4,898,050

CLASS 75

3 4,898,611
249 4,898,612
251 4,898,613

CLASS 81

57.2 4,898,051
57.43 4,898,052
125 4,898,053
483 4,898,068

CLASS 82

160 4,898,054

CLASS 83

571 4,898,055
689 4,898,056
831 4,898,057
870 4,898,058

CLASS 84

95.2 4,898,060
402 4,898,061
422.3 4,898,062
601 4,898,059

CLASS 86

20.1 4,898,066

CLASS 87

8 4,898,067

CLASS 89

33.01 4,898,069
34 4,898,070
45 4,898,071
4,898,072
845 4,897,919

CLASS 91

369.2 4,898,073
371 4,898,074
477 4,898,075
491 4,898,076
505 4,898,077
524 4,898,078

CLASS 92

5 R 4,898,079
14 4,898,080
132 4,898,082
165 R 4,898,081
255 4,898,083

CLASS 98

1 4,898,085
33.1 4,898,086
40.1 4,898,087
49 4,898,088
115.1 4,898,089

CLASS 99

306 4,898,090
336 4,898,091
487 4,898,092

CLASS 101

91 4,898,093
485 4,898,094

CLASS 102

201 4,898,095
221 4,898,096
283 4,898,097
334 4,898,098

CLASS 104

172.4 4,898,099
192 4,898,100

CLASS 105

247 4,898,101

CLASS 106

3 4,898,614
103 4,898,615
271 4,898,616
281.1 4,898,617
287.34 4,898,618
459 4,898,619
464 4,898,620

CLASS 108

56.1 4,898,102
144 4,898,103

CLASS 109

1 R 4,898,104

CLASS 110

245 4,898,105
346 4,898,106
4,898,107

CLASS 111

185 4,898,108

CLASS 112

121.14 4,898,109
314 4,898,110

CLASS 114

61 4,898,111
255 4,898,112
283 4,898,113
343 4,898,114

CLASS 116

236 4,898,115

CLASS 118

621 4,898,116
665 4,898,117
723 4,898,118

CLASS 119

29 4,898,119
4,898,120
98 4,898,121

CLASS 122

6 A 4,898,122
379 4,898,123
382 4,898,124

CLASS 123

52 M 4,898,144
52 MC 4,898,125
53 A 4,898,126
73 A 4,898,127
90.12 4,898,128
90.13 4,898,129
90.16 4,898,130
90.44 4,898,131
179 B 4,898,132
182 4,898,133
195 R 4,898,134
263 4,898,135
269 4,898,136
352 4,898,137
399 4,898,138
425 4,898,139
510 4,898,140
541 4,898,141
557 4,898,142
571 4,898,143

CLASS 124

41 A 4,898,145

CLASS 126

116 A 4,898,146
200 4,898,147
204 4,898,148
299 R 4,898,149
361 4,898,150
391 4,898,151
422 4,898,152
448 4,898,153
500 4,898,154

CLASS 128

79 4,898,158
90 4,898,159
91 R 4,898,160
155 4,898,162
200.26 4,898,163
202.18 4,898,164
204.18 4,898,165
204.24 4,898,174
205.13 4,898,166
205.16 4,898,167
207.15 4,898,168
397 4,898,172
419 P 4,898,173
634 4,898,175
642 4,898,176
662.03 4,898,177
662.05 4,898,178
670 4,898,179
681 4,898,180
699 4,898,181
707 4,898,182
784 4,898,183
844 4,898,184
876 4,898,185

CLASS 131

284 4,898,187
296 4,898,188
299 4,898,189
336 4,898,190
359 4,898,191

CLASS 132

73 4,898,192
218 4,898,193
251 4,898,194
317 4,898,195
327 4,898,196

CLASS 134

8 4,898,197
25.2 4,898,621

CLASS 135

90 4,898,198

CLASS 137

68.1 4,898,199
85 4,898,200
245.5 4,898,201
268 4,898,202
269 4,898,203
505.12 4,898,205
505.41 4,898,204
512.3 4,898,206
539 4,898,207
614.04 4,898,209
614.19 4,898,210
614.2 4,898,208
615 4,898,211

CLASS 138

130 4,898,212

CLASS 139

1 R 4,898,213
116 A 4,898,214

CLASS 140

105 4,898,215

CLASS 141

4 4,898,216
83 4,898,217

CLASS 144

2 Z 4,898,218
4,898,219
194 4,898,220
340 4,898,221

CLASS 148

2 4,898,622
3 4,898,623
11.5 F 4,898,624
12 B 4,898,629
101 4,898,625
111 4,898,626
4,898,627
4,898,628

CLASS 150

160 4,898,222

CLASS 152

547 4,898,223

CLASS 156

79 4,898,630
89 4,898,631
99 4,898,632
145 4,898,633
167 4,898,634
172 4,898,637
204 4,898,640
245 4,898,635
272.6 4,898,638
345 4,898,639
601 4,898,641
626 4,898,636

CLASS 160

310 4,898,224

CLASS 162

157.6 4,898,642
259 4,898,643

CLASS 164

158 4,898,225
417 4,898,227
460 4,898,228

CLASS 165

11.1 4,898,229
12 4,898,230
13 4,898,231
151 4,898,232
166 4,898,233
170 4,898,234

CLASS 166

64 4,898,235
65.1 4,898,236
66 4,898,237
75.1 4,898,238

133 4,898,239
250 4,898,240
4,898,241
285 4,898,242
290 4,898,243
297 4,898,244
387 4,898,245

CLASS 168

415 4,898,226

CLASS 169

38 4,898,246

CLASS 172

799.5 4,898,247

CLASS 173

12 4,898,248
4,898,249
48 4,898,250

CLASS 174

4,899,018
67 4,899,019
68.5 4,899,020

CLASS 175

27 4,898,251
379 4,898,252

CLASS 177

25.13 4,898,253
210 C 4,898,254
211 4,898,255

CLASS 180

8.2 4,898,256
9.1 4,898,257
79.1 4,898,258
250 4,898,259

CLASS 181

148 4,898,260

CLASS 184

6.22 4,898,261
6.4 4,898,262

CLASS 187

133 4,898,263

CLASS 188

275 4,898,264

CLASS 192

8 R 4,898,265
21.5 4,898,266
4,898,267

CLASS 198

345 4,898,268
346.1 4,898,269
396 4,898,270
444 4,898,271
841 4,898,272

CLASS 200

43.13 4,899,021
50 A 4,899,022
61.12 4,899,023
331 4,899,050

CLASS 203

15 4,898,644
67 4,898,645

CLASS 204

1 T 4,898,646
13 4,898,647
15 4,898,648
28 4,898,649
29 4,898,650
4,898,651
44.2 4,898,652
128 4,898,653
157.71 4,898,654
157.87 4,898,655
181.1 4,898,656
198 4,898,657
299 R 4,898,658

CLASS 206

204 4,898,273
289 4,898,274
330 4,898,275
369 4,898,276
387 4,898,277
443 4,898,278
586 4,898,279
604 4,898,280

CLASS 208

33 4,898,659
114 4,898,660
117 4,898,661
120 4,898,662
178 4,898,663

CLASS 209

235 4,898,664
273 4,898,665
425 4,898,666

CLASS 210

138 4,898,667
180 4,898,668
232 4,898,669
4,898,670
333.01 4,898,671
614 4,898,672
634 4,898,673
638 4,898,674
651 4,898,675
668 4,898,676
701 4,898,677
741 4,898,678
752 4,898,679

CLASS 211

13 4,898,281
49.1 4,898,282
57.1 4,898,283
162 4,898,284
183 4,898,285
187 4,898,286

CLASS 212

177 4,898,287
191 4,898,288
270 4,898,289

CLASS 215

11.1 4,898,290
11.4 4,898,291
237 4,898,292
250 4,898,293
323 4,899,089

CLASS 219

10.41 4,899,024
10.493 4,899,027
4,899,028
10.55 M 4,899,026
10.57 4,899,025
56.1 4,899,029
121.63 4,899,030
213 4,899,031
375 4,899,032
451 4,899,033
494 4,899,034

CLASS 220

3.1 4,898,294
66 4,898,295
72 4,898,296
85 H 4,898,297
90.2 4,898,298
90.4 4,898,299
334 4,898,300
408 4,898,301

CLASS 222

49 4,898,302
65 4,898,303
82 4,898,304
142.5 4,898,305
206 4,898,306
207 4,898,307
325 4,898,308

CLASS 223

111 4,898,309

CLASS 224

238 4,898,310
257 4,898,311

CLASS 225

26 4,898,312

CLASS 226

197 4,898,313

CLASS 227

3 4,898,314
10 4,898,315
120 4,898,316

CLASS 228

41 4,898,317
183 4,898,318
219 4,898,319
245 4,898,320

CLASS 229

23 R 4,898,321
69 4,898,322
92.3 4,898,323

CLASS 235

380 4,899,036
441 4,899,035
493 4,899,037
4,899,038

CLASS 236

92 R 4,898,324

CLASS 237

12.3 B 4,898,325

CLASS 238

10 E 4,898,326

CLASS 239

1 4,898,327
6 4,898,328
13 4,898,329
135 4,898,330
223 4,898,331
240 4,898,332
589.1 Re.33,158
Re.33,159
657 4,898,333

CLASS 241

194 4,898,334

CLASS 242

55.42 4,898,335
59 4,898,336
151 4,898,337
198 4,898,338
231 4,898,339

CLASS 244

3.11 4,898,340
3.16 4,898,341
3.21 4,898,342
4 A 4,898,345
12.4 4,898,343
116 4,898,344
148 4,898,346
158 R 4,898,347
161 4,898,348
4,898,349

CLASS 248

27.1 4,898,350
51 4,898,351
96 4,898,352
225.1 4,898,354
235 4,898,355
429 4,898,356
906 4,898,357

CLASS 249

7 4,898,358
54 4,898,359

CLASS 250

209 4,899,039
216 4,899,040
222.1 4,899,041
227 4,899,042
4,899,043
4,899,044
4,899,045
4,899,046
4,899,047
231 SE 4,899,048
327.2 4,899,049
340 4,899,051
342 4,899,052
343 4,899,053
369 4,899,054
372 4,899,055
431 4,899,056
436 4,899,057
492.1 4,899,058
492.2 4,899,059
505.1 4,899,060
560 4,899,061

CLASS 251

129.01 4,898,360
129.05 4,898,361
129.12 4,898,362
173 4,898,363

CLASS 252

8.8 4,898,680
47.5 4,898,682
51 4,898,683
102 4,898,681
181 4,898,684
353 4,898,685
389.2 4,898,686
389.61 4,898,687
400.24 4,898,688
510 4,898,689
554 4,898,690
589 4,898,691
629 4,898,692

CLASS 254

342 4,898,364

CLASS 256

65 4,898,365

CLASS 260

397.4 4,898,693
397.5 4,898,694

CLASS 264

2.6 4,898,695
4.7 4,898,696
37 4,898,697
41 4,898,698
43 4,898,699
B1 4,728,471
83 4,898,700
109 4,898,701
145 4,898,702
166 4,898,703
180 4,898,704
242 4,898,705
266 4,898,706
515 4,898,707
4,898,708

CLASS 266

160 4,898,366
216 4,898,367
222 4,898,368
266 4,898,369

CLASS 269

91 4,898,370
136 4,898,371

CLASS 270

53 4,898,372
58 4,898,373

CLASS 271

178 4,898,374
246 4,898,375
272 4,898,376

CLASS 272

36 4,898,377
69 4,898,378
73 4,898,379
117 4,898,380
4,898,381

CLASS 273

1 G 4,898,383
1 GC 4,898,382
26 B 4,898,386
26 E 4,898,385
26 R 4,898,384
167 F 4,898,387
181 R 4,898,388
186 A 4,898,389
249 4,898,390
310 4,898,391
336 4,898,392

CLASS 277

27 4,898,393
35 4,898,394
207 A 4,898,395
235 B 4,898,396

CLASS 279

4 4,898,397

CLASS 280

87.042 4,898,398
408 4,898,399
427 4,898,400
605 4,898,401
804 4,898,402
842 4,898,403

CLASS 281

15.1 4,898,404
29 4,898,405
43 4,898,406

CLASS 285

328 4,898,407

CLASS 292

7 4,898,408
31 4,898,409
241 4,898,410
292 4,898,411
310 4,898,412
336.3 4,898,413
337 4,898,414
347 4,898,415

CLASS 294

119.1 4,898,416

CLASS 296

97.23 4,898,417
181 4,898,418
204 4,898,419
219 4,898,420

CLASS 297

28 4,898,421
202 4,898,422
362 4,898,423
367 4,898,424
444 4,898,425
452 4,898,426

CLASS 298

22 C 4,898,427

CLASS 299

30 4,898,428

CLASS 301

9 DN 4,898,429

CLASS 303

84.2 4,898,430
100 4,898,431
114 4,898,432
115 4,898,433
119 4,898,434

CLASS 307

3 4,899,062
9.1 4,899,063
45.2 4,899,066
261 4,899,064
270 4,899,065
465 4,899,067
494 4,899,068
520 4,899,069
530 4,899,070
605 4,899,071

CLASS 310

49 R 4,899,072
116 4,899,073
154 4,899,074
257 4,899,075
356 4,899,076

CLASS 312

325 4,899,077

CLASS 313

37 4,899,078
412 4,899,079
477 R 4,899,080
496 4,899,081
594 4,899,092

CLASS 315

8 4,899,082
77 4,899,083
111.81 4,899,084
116 4,899,085
169.3 4,899,086
241 P 4,899,087
291 4,899,088
335 4,899,090
382 4,899,091

CLASS 318

254 4,899,093
567 4,899,094
568.16 4,899,095
573 4,899,096
663 4,899,097

CLASS 323

277 4,899,098

CLASS 324

99 D 4,899,103
158 F 4,899,099
4,899,104
4,899,105
4,899,106
4,899,107
318 4,899,108
320 4,899,109
4,899,110
321 4,899,111
338 4,899,112
636 4,899,100
663 4,899,101
4,899,102

CLASS 328

258 4,899,113

CLASS 330

251 4,899,116
253 4,899,114
302 4,899,115

CLASS 331

3 4,899,117

CLASS 333

246 4,899,118

CLASS 335

14 4,899,119
132 4,899,120
245 4,899,121

CLASS 336

65 4,899,122

CLASS 337

273 4,899,123
299 4,899,124

CLASS 338

2 4,899,125
309 4,899,126

CLASS 340

146.2 4,899,127
4,899,128
310 R 4,899,129
438 4,899,130
518 4,899,131
551 4,899,132
573 4,899,133
4,899,134
4,899,135
706 4,899,136
711 4,899,137
712 4,899,138
721 4,899,139
756 4,899,140
784 4,899,141
825.050 4,899,142
825.5 4,899,143
856 4,899,144

CLASS 341

15 4,899,145
51 4,899,146
60 4,899,147
65 4,899,148
67 4,899,149
118 4,899,150
145 4,899,151
154 4,899,152
156 4,899,153
159 4,899,154
200 4,899,155

CLASS 342

37 4,899,156
40 4,899,157
44 4,899,158
90 4,899,159
408 4,899,160
451 4,899,161

CLASS 343

700 MS 4,899,162
4,899,163
754 4,899,164
767 4,899,165
873 4,899,166
915 4,899,167

CLASS 346

1.1 4,899,168
76 PH 4,899,170
4,899,171
4,899,172
82 4,899,173
107 R 4,899,174
108 4,899,175
4,899,176
139 R 4,899,177
140 R 4,899,178
4,899,179
4,899,180
4,899,181
153.1 4,899,182
154 4,899,183
155 4,899,184
4,899,185
159 4,899,186
742 4,899,169

CLASS 350

1.1 4,898,435
3.64 4,898,436
6.7 4,898,437
96.10 4,898,438
4,898,439
96.13 4,898,440
96.14 4,898,441
96.15 4,898,442
4,898,443
4,898,444
96.20 4,898,445
4,898,446
4,898,447
4,898,448
96.21 4,898,449
4,898,450
96.23 4,898,451
97 4,898,452
255 4,898,453
350 R 4,898,454
4,898,455
350 S 4,898,456
463 4,898,457
584 4,898,458

CLASS 351

46 4,898,459
114 4,898,460
169 4,898,461

CLASS 354

75 4,899,188
152 4,899,187
293 4,899,189
400 4,899,190
421 4,899,191

CLASS 355

51 4,899,192
55 4,899,193
56 4,899,194
77 4,899,195
271 4,899,196
290 4,899,197
297 4,899,198

CLASS 356

70 4,898,462
73.1 4,898,463
152 4,898,464
311 4,898,465
313 4,898,466
328 4,898,467
345 4,898,468
350 4,898,469
359 4,898,470
394 4,898,471

CLASS 357

22 4,899,201
23.6 4,899,203
23.7 4,899,202
30 4,899,200
4,899,204
51 4,899,205
67 4,899,206
70 4,899,207
74 4,899,208
4,899,209
81 4,899,210
82 4,899,211

CLASS 358

29 4,899,212
44 4,899,213
75 4,899,214
78 4,899,215
80 4,899,216
86 4,899,217
93 4,899,218
107 4,899,219
141 4,899,220
167 4,899,221
296 4,899,222
302 4,899,223
332 4,899,224
448 4,899,225
451 4,899,226
452 4,899,227
473 4,899,228

CLASS 360

15 4,899,230
33.1 4,899,231
48 4,899,232
77.14 4,899,233
78.06 4,899,234
85 4,899,235
95 4,899,236
98.02 4,899,237
99.06 4,899,238
106 4,899,239
113 4,895,240
125 4,899,241
132 4,899,242
4,899,243
133 4,899,244
137 4,899,245
141 4,899,229

CLASS 361

44 4,899,246
72 4,899,247
127 4,899,248
317 4,899,249
341 4,899,250
346 4,899,251
350 4,899,252
376 4,899,253
384 4,899,254
386 4,899,255
4,899,256
395 4,899,257
534 4,899,258
539 4,899,259

CLASS 362

32 4,899,260
61 4,899,261
80 4,899,262
4,899,263
92 4,899,264
187 4,899,265
238 4,899,266
277 4,899,267

CLASS 363

4 4,899,268
41 4,899,269
56 4,899,270
126 4,899,271

CLASS 364

200 4,899,273
4,899,274
4,899,275
300 4,899,276
413.15 4,899,283
422 4,899,277
424.05 4,899,279
424.1 4,899,278
431.04 4,899,281
431.05 4,899,280
431.08 4,899,282
435 4,899,284
453 4,899,285
470 4,899,286
4,899,287
476 4,899,288
484 4,899,289
513 4,899,290
518 4,899,291
521 4,899,292
4,899,293
522 4,899,294
4,899,295
550 4,899,296
557 4,899,297
558 4,899,298
570 4,899,299
725 4,899,300
726 4,899,301
729 4,899,302
739 4,899,303
745 4,899,304
787 4,899,305
900 4,899,306

CLASS 365

78 4,899,307
104 4,899,308
189.01 4,899,309
4,899,316
189.05 4,899,310
189.06 4,899,311
201 4,899,313
203 4,899,317
222 B1 4,575,826
226 4,899,314
230.03 4,899,272
230.06 4,899,315
230.09 4,899,312

CLASS 366

18 4,898,472
132 4,898,473
286 4,898,474

CLASS 367

8 4,899,318
35 4,899,319
4,899,320
48 4,899,321
59 4,899,322
176 4,899,323

CLASS 368

76 4,899,324

CLASS 369

32 4,899,325
4,899,331
36 4,899,326
45 4,899,327
77.2 4,899,328
275 4,899,329
289 4,899,330

CLASS 370

32 4,899,332
60 4,899,333
4,899,334
4,899,335
63 4,899,336
80 4,899,337
85.1 4,899,338
102 4,899,339

CLASS 371

10.1 4,899,342
37.1 4,899,340
37.6 4,899,341

CLASS 372

9 4,899,343
29 4,899,344
32 4,899,345
4,899,346
33 4,899,347
38 4,899,348
44 4,899,349
4,899,359
50 4,899,360
55 4,899,361
4,899,362
65 4,899,363

CLASS 374

28 4,898,475
4,898,476

CLASS 375

1 4,899,364
13 4,899,365
14 4,899,366
39 4,899,367
52 4,899,350
108 4,899,351
118 4,899,352

CLASS 376

159 4,898,709
261 4,898,710

CLASS 377

28 4,899,353

CLASS 378

34 4,899,354
4,899,355
58 4,899,356
148 4,899,357

CLASS 379

67 4,899,358
4,899,368
101 4,899,369
104 4,899,370
146 4,899,371
184 4,899,372
207 4,899,373
215 4,899,374
264 4,899,375
327 4,899,376
354 4,899,377
374 4,899,378
377 4,899,379
389 4,899,380
393 4,899,381
413 4,899,382

CLASS 380

48 4,899,383

CLASS 381

31 4,899,384
36 4,899,385
43 4,899,386
71 4,899,387
77 4,899,388
94 4,899,389
154 4,899,390

CLASS 382

1 4,899,391
4,899,392
6 4,899,393
9 4,899,394

CLASS 383

33 4,898,477

CLASS 384

45 4,898,478
130 4,898,479
446 4,898,480
581 4,898,481
626 4,898,482

CLASS 387

15 4,899,199

CLASS 4.8

188.7 4,898,353

CLASS 400

61 4,898,483
120 4,898,484
121 4,898,485
241.2 4,898,486
354 4,898,487
642 4,898,488
656 4,898,489

CLASS 403

56 4,898,490
96 4,898,491
340 4,898,492
407.1 4,898,493

CLASS 404

002 4,898,494

CLASS 405

73 4,898,495
141 4,898,496
154 4,898,497
184 4,898,498

CLASS 407

42 4,898,499
62 4,898,500

CLASS 408

32 4,898,501
72 B 4,898,502
230 4,898,503

CLASS 409

81 4,898,504

CLASS 411

55 4,898,505

CLASS 412

8 4,898,506

CLASS 414

225 4,898,507
476 4,898,508
495 4,898,509
557 4,898,510
792.6 4,898,511

CLASS 415

1 4,898,512
121.2 4,898,513

CLASS 416

95 4,898,514
134 A 4,898,515
247 R 4,898,516

CLASS 417

151 4,898,517
360 4,898,518
379 4,898,519

CLASS 418

1 4,898,520
55 4,898,521
61.2 4,898,522
70 4,898,523
136 4,898,524
227 4,898,525
257 4,898,526

CLASS 419

27 4,898,711

CLASS 420

578 4,898,712

CLASS 422

3 4,898,713
133 4,898,714
186.29 4,898,715
190 4,898,716
4,898,717
211 4,898,718

CLASS 423

21.5 4,898,719
210 4,898,720
240 4,898,721
308 Re.33,161
328 4,898,722
447.4 4,898,723

CLASS 424

1.1 4,898,724
70 4,898,725
72 4,898,726
76.1 4,898,727
80 4,898,728
4,898,729
88 4,898,730
114 4,898,731
422 4,898,732
425 4,898,733
426 4,898,734
450 4,898,735
465 4,898,736
468 4,898,737

CLASS 425

143 4,898,527
185 4,898,528
542 4,898,529

CLASS 426

17 4,898,738
35 4,898,739
106 4,898,740
231 4,898,741
271 4,898,742
523 4,898,743
557 4,898,744
582 4,898,745

CLASS 427

10 4,898,746
31 4,898,747
38 4,898,748
216 4,898,749
221 4,898,750
230 4,898,751
265 4,898,752
276 4,898,753
369 4,898,754
389.7 4,898,755

CLASS 428

34.1 4,898,756
97 4,898,757
99 4,898,758
4,898,759
122 4,898,760
137 4,898,761
152 4,898,762
159 4,898,763
188 4,898,764
195 4,898,765
4,898,766
210 4,898,767
216 4,898,768
283 4,898,769
4,898,770
316 4,898,771
332 4,898,772
4,898,773
336 4,898,774
4,898,775
4,898,776
364 4,898,777
368 4,898,778
402 4,898,779
402.21 4,898,780
402.22 4,898,781
407 4,898,782
408 4,898,783
412 4,898,784
472 4,898,785
480 4,898,786
4,898,787
481 4,898,788
623 4,898,789
4,898,790
629 4,898,791

CLASS 429

19 4,898,792
38 4,898,793
59 4,898,794
66 4,898,795
178 4,898,796

CLASS 430

51 4,898,797
58 4,898,798
59 4,898,799
4,898,800
106.6 4,898,801
110 4,898,802
191 4,898,803
311 4,898,804
315 4,898,805
325 4,898,806
378 4,898,807
510 4,898,808
523 4,898,809
4,898,810
546 4,898,811
548 4,898,812

CLASS 431

11 4,898,530
12 4,898,531
253 4,898,532

CLASS 432

58 4,898,533
250 4,898,534

CLASS 433

6 4,898,535

CLASS 434

114 4,898,536
130 4,898,537

CLASS 435

4 4,898,813
6 4,898,814
7 4,898,815
34 4,898,816
49 4,898,817
69.1 4,898,818
93 4,898,819
95 4,898,820
119 4,898,821
121 4,898,822
172.3 4,898,823
180 4,898,824
212 4,898,825
226 4,898,826
244 4,898,827
252.3 4,898,828
289 4,898,829
320 4,898,830

CLASS 436

32 4,898,831
45 4,898,832
63 4,898,833

CLASS 437

22 4,898,834
29 4,898,835
31 4,898,836
4,898,837
4,898,838
33 4,898,839
41 4,898,840
200 4,898,841

CLASS 439

76 4,898,538
81 4,898,539
153 4,898,540
248 4,898,541
371 4,898,542
374 4,898,543
498 4,898,544
578 4,898,545
608 4,898,546
652 4,898,547
686 4,898,548
701 4,898,549
718 4,898,550
789 4,898,551

CLASS 440

1 4,898,563
71 4,898,552
76 4,898,553

CLASS 445

6 4,898,554
22 4,898,555
36 4,898,556
49 4,898,557
53 4,898,558
64 4,898,559

CLASS 446

85 4,898,560
220 4,898,561
460 4,898,562

CLASS 453

3 4,898,564

CLASS 455

612 4,898,565

CLASS 464

167 4,898,566

CLASS 474

174 4,898,567
245 4,898,568

CLASS 475

179 4,898,065

CLASS 493

361 4,898,569
420 4,898,570

CLASS 494

26 4,898,571

CLASS 501

9 4,898,842
136 4,898,843
138 4,898,844

CLASS 502

3 4,898,845
67 4,898,846

CLASS 503

200 4,898,848
214 4,898,849
227 4,898,850

CLASS 505

1 4,898,851

CLASS 514

54 4,898,852
63 4,898,853
89 4,898,854
167 4,898,855
171 4,898,856
4,898,857
206 4,898,858
210 4,898,859
215 4,898,860
221 4,898,861
235.2 4,898,863
236.2 4,898,862
237.5 4,898,864
252 4,898,865
4,898,866
258 4,898,867
277 4,898,868
280 4,898,869
292 4,898,870
300 4,898,871
303 4,898,872
327 4,898,873
379 4,898,874
383 4,898,875
386 4,898,878

CLASSIFICATION OF PATENTS

400 4,898,879
406 4,898,880
481 4,898,881
492 4,898,882
521 4,898,877
544 4,898,883
553 4,898,884
560 4,898,885
588 4,898,886
617 4,898,887
642 4,898,888
654 4,898,889
685 4,898,890
732 4,898,891

CLASS 521

54 4,898,892
4,898,894
131 4,898,893

CLASS 522

110 4,898,847

CLASS 523

122 4,898,895
343 4,898,897
351 4,898,898

CLASS 524

90 4,898,899
220 4,898,900
237 4,898,901
275 4,898,902
398 4,898,903
399 4,898,904
404 4,898,905
406 4,898,906
490 4,898,907
593 4,898,908
820 4,898,909
860 4,898,910

CLASS 525

74 4,898,911
199 4,898,912
301 4,898,913
314 4,898,914
326.7 4,898,915
344 4,898,916
420 4,898,917
425 4,898,918
440 4,898,919
477 4,898,920

CLASS 527

300 4,898,921

CLASS 528

60 4,898,922
73 4,898,923
183 4,898,924
230 4,898,925
323 4,898,896
328 4,898,926
377 4,898,927
392 4,898,928
399 4,898,929

CLASS 530

332 4,898,930
351 4,898,931
387 4,898,932

CLASS 534

605 4,898,933

CLASS 536

17.1 4,898,936
18.6 4,898,934
119 4,898,935

CLASS 540

227 4,898,937
230 4,898,938
310 4,898,939
460 4,898,940
596 4,898,941

CLASS 544

243 4,898,942
251 4,898,943
325 B1 3,956,327
337 4,898,944
391 4,898,876

CLASS 546

95 4,898,945
216 4,898,946
280 4,898,947

CLASS 548

171 4,898,948
253 4,898,949
4,898,950
303 4,898,951
378 4,898,952

CLASS 549

408 4,898,953
519 4,898,954

CLASS 556

12 4,898,955
401 4,898,956
418 4,898,957
448 4,898,958
466 4,898,959
472 4,898,960
479 4,898,961

CLASS 558

58 4,898,962
146 4,898,963
416 4,898,964
4,898,965

CLASS 560

38 4,898,966
051 4,898,967
124 4,898,968
187 4,898,969
236 4,898,970
359 4,898,971

CLASS 562

17 4,898,972
429 4,898,973
577 4,898,974

CLASS 564

2 4,898,975
112 4,898,976
191 4,898,977
231 4,898,978
418 4,898,979

CLASS 568

'23 4,898,980
28 4,898,981
58 4,898,982
322 4,898,983
342 4,898,984
344 4,898,985
376 4,898,986
385 4,898,987
386 4,898,988
399 4,898,989
438 4,898,990
615 4,898,991
618 4,898,992
658 4,898,993
720 4,898,994
798 4,898,995
938 4,898,996

CLASS 570

128 4,898,997
204 4,898,998
207 4,898,999
222 4,899,000

CLASS 585

310 4,899,001
312 4,899,002
313 4,899,003
321 4,899,004
360 4,899,005
415 4,899,006
467 4,899,007
4,899,008
471 4,899,009
480 4,899,010
481 4,899,011
482 4,899,012
506 4,899,013
533 4,899,014
4,899,015
826 4,899,016
828 4,899,017

CLASS 604

4 4,898,572
6 4,898,573
22 4,898,574
4,898,575
50 4,898,576
53 4,898,577
66 4,898,578
67 4,898,579
90 4,898,580
122 4,898,581
141 4,898,582
153 4,898,583
4,898,584
4,898,585
171 4,898,586
174 4,898,587
187 4,898,588
198 4,898,589
4,898,590
282 4,898,591
307 4,898,592
319 4,898,593
397 4,898,594

CLASS 606

42 4,898,169
62 4,898,186
72 4,898,156
105 4,898,161
144 4,898,155
147 4,898,157
166 4,898,170
236 4,898,171

CLASSIFICATION OF DESIGNS

D2— 187 305,825
211 305,826
229 305,827
314 305,828
320 305,829
602 305,830
D3— 36 305,831
75 305,832
D6— 312 305,833
326 305,834
305,835
405 305,836
419 305,837
420 305,838
462 305,839
474 305,840
475 305,841
480 305,842
502 305,843
598 305,844
601 305,845
D7— 317 305,853
319 305,854
323 305,855
351 305,856
397 305,857
555 305,846
564 305,847
605 305,851
606 305,849
608 305,850
635 305,848
681 305,852
D8— 5 305,858
14 305,859
305,860
330 305,861
350 305,862
352 305,863
382 305,864
D9— 311 305,865
305,866
337 305,867
305,868
341 305,869
415 305,870
435 305,871
448 305,872
D10— 62 305,873
D11— 1 305,874
143 305,875
147 305,876
D12— 3 305,877
157 305,878
181 305,879
D13— 2 305,880
38 305,881
D14— 105 305,882
106 305,883
116 305,884
305,885
117 305,886
305,887
138 305,888
143 305,889
146 305,890
151 305,891
213 305,892
215 305,893
D15— 23 305,894
29 305,895
127 305,896
133 305,897
138 305,898
141 305,899
D16— 102 305,900
123 305,901
133 305,902
202 305,903
232 305,904
D17— 99 305,905
D18— 2 305,906
12 305,907
13 305,908
41 305,909
D19— 42 305,910
D20— 44 305,911
D21— 29 305,912
51 305,913
59 305,914
75 305,915
148 305,919
149 305,916
305,917
150 305,918
189 305,920
212 305,922
217 305,921
D22— 104 305,923
122 305,924
D23— 216 305,925
249 305,926
305,927
350 305,928
364 305,929
404 305,930
305,931
D24— 1.1 305,932
10 305,933
12 305,935
21 305,934
D25— 11 305,936
56 305,937
113 305,938
D26— 28 305,939
305,940
35 305,941
93 305,942
118 305,943
D28— 38 305,944
77 305,945
305,946
78 305,947
D32— 53 305,948
D34— 31 305,949

CLASSIFICATION OF PLANTS

P.— 8 7,136
15 7,137
18 7,138
22 7,139
33 7,140
7,141
34 7,142
69 7,143
71 7,144
73 7,145

STATUTORY INVENTION REGISTRATIONS

60— 242 H747
73— 178 R H746
204— 418 H745
252— 478 H744
323— 313 H743
330— 4.3 H742
342— 25 H741
384 H739
H740
350— 3.7 H738
347 E H737
423— 290 H736
424— 1.1 H735
434— 189 H733
514— 19 H734
525— 92 H731
471 H732
528— 244 H730
342 H729
564— 309 H728

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 : 4,897,892	4,898,431	4,899,180	4,899,021	4,898,034	4,898,813
4,898,522	4,898,436	4,899,188	4,899,115	4,898,075	4,898,824
4,898,620	4,898,437	4,899,199	4,899,172	4,898,134	4,898,828
4,898,926	4,898,450	4,899,205	4,899,263	4,898,145	4,898,975
4,899,031	4,898,461	4,899,240	4,899,369	4,898,209	19 : 4,897,922
04 : 4,897,900	4,898,468	4,899,254	10 : 4,897,965	4,898,228	4,897,960
4,898,222	4,898,471	4,899,265	4,898,020	4,898,263	4,897,969
4,898,352	4,898,503	4,899,272	4,898,851	4,898,265	4,898,078
4,898,497	4,898,512	4,899,275	4,898,863	4,898,272	4,898,178
4,899,116	4,898,531	4,899,307	4,898,991	4,898,280	4,898,464
4,899,159	4,898,543	4,899,308	12 : Re.33,160	4,898,281	4,898,708
4,899,382	4,898,555	4,899,317	4,898,008	4,898,286	4,898,845
05 : 4,898,383	4,898,565	4,899,340	4,898,021	4,898,292	21 : 4,898,191
4,898,672	4,898,577	4,899,351	4,898,085	4,898,373	4,898,248
06 : 4,897,888	4,898,578	4,899,387	4,898,111	4,898,394	4,898,556
4,897,910	4,898,582	4,899,394	4,898,172	4,898,523	22 : 4,897,923
4,897,936	4,898,583	08 : 4,898,048	4,898,284	4,898,524	4,898,104
4,897,961	4,898,584	4,898,063	4,898,380	4,898,535	4,898,235
4,897,972	4,898,585	4,898,170	4,898,469	4,898,548	4,898,304
4,897,979	4,898,587	4,898,270	4,898,482	4,898,550	4,898,335
4,897,980	4,898,601	4,898,314	4,898,495	4,898,611	4,898,387
4,897,994	4,898,631	4,898,389	4,898,514	4,898,644	4,898,663
4,898,000	4,898,639	4,898,444	4,898,547	4,898,686	4,898,888
4,898,007	4,898,678	4,898,529	4,898,552	4,898,692	4,898,929
4,898,030	4,898,695	4,898,768	4,898,599	4,898,726	23 : 4,897,896
4,898,047	4,898,711	4,898,827	4,898,636	4,898,745	4,897,953
4,898,058	4,898,743	4,899,100	4,898,702	4,898,763	24 : Re.33,158
4,898,080	4,898,748	4,899,189	4,898,757	4,898,856	Re.33,159
4,898,107	4,898,774	4,899,230	4,898,776	4,898,857	Re.33,161
4,898,115	4,898,830	4,899,327	4,898,923	4,898,879	4,897,919
4,898,153	4,898,834	4,899,363	4,898,936	4,898,982	4,897,973
4,898,162	4,898,848	09 : 4,897,907	4,899,222	4,899,001	4,898,135
4,898,167	4,898,884	4,897,947	4,899,366	4,899,010	4,898,299
4,898,174	4,898,903	4,897,951	4,575,826	4,899,012	4,898,331
4,898,202	4,898,928	4,897,952	13 : 4,898,086	4,899,013	4,898,381
4,898,234	4,898,973	4,898,004	4,898,101	4,899,018	4,898,384
4,898,260	4,899,039	4,898,044	4,898,171	4,899,101	4,898,534
4,898,276	4,899,045	4,898,120	4,898,302	4,899,146	4,898,542
4,898,282	4,899,055	4,898,206	4,898,308	4,899,306	4,898,575
4,898,285	4,899,067	4,898,305	4,898,564	4,899,333	4,898,752
4,898,290	4,899,070	4,898,324	4,899,019	4,899,335	4,898,777
4,898,311	4,899,084	4,898,329	4,899,022	4,899,358	4,898,846
4,898,323	4,899,097	4,898,515	4,899,197	4,899,373	4,898,988
4,898,332	4,899,103	4,898,520	4,899,253	4,899,385	4,899,129
4,898,345	4,899,109	4,898,570	15 : 4,899,381	18 : 4,897,914	4,899,134
4,898,347	4,899,111	4,898,668	16 : 4,898,310	4,898,081	4,899,157
4,898,371	4,899,118	4,898,732	4,898,330	4,898,204	4,899,217
4,898,391	4,899,135	4,898,742	4,899,107	4,898,298	25 : 4,897,934
4,898,397	4,899,136	4,898,759	17 : 4,897,899	4,898,361	4,898,148
4,898,398	4,899,151	4,898,877	4,897,905	4,898,393	4,898,152
4,898,408	4,899,153	4,898,949	4,897,916	4,898,432	4,898,156
4,898,416	4,899,154	4,898,950	4,898,015	4,898,673	4,898,295
4,898,429	4,899,173	4,899,000	4,898,019	4,898,733	4,898,340

4,898,341
4,898,405
4,898,479
4,898,491
4,898,544
4,898,576
4,898,597
4,898,603
4,898,658
4,898,667
4,898,670
4,898,715
4,898,719
4,898,734
4,898,760
4,898,804
4,898,844
4,898,869
4,898,932
4,899,059
4,899,082
4,899,207
4,899,210
4,899,244
4,899,283
4,899,342
4,899,346
4,899,391
26 : 4,897,906
4,897,912
4,897,913
4,897,930
4,897,931
4,897,975
4,897,997
4,898,016
4,898,046
4,898,124
4,898,165
4,898,185
4,898,211
4,898,216
4,898,257
4,898,266
4,898,267
4,898,287
4,898,355
4,898,357
4,898,365
4,898,378
4,898,392
4,898,490
4,898,493
4,898,494
4,898,504
4,898,614
4,898,652
4,898,681
4,898,712
4,898,721
4,898,758
4,898,893
4,898,907
4,898,910
4,898,913
4,898,920
4,898,956
4,898,957
4,898,960
4,898,961
4,899,034
4,899,218
4,899,256
4,899,262
4,899,264
4,899,279
4,899,338
27 : 4,897,890
4,897,956
4,897,970

4,898,071
4,898,092
4,898,097
4,898,173
4,898,297
4,898,320
4,898,406
4,898,465
4,898,518
4,898,528
4,898,633
4,898,762
4,898,852
4,898,945
4,899,048
4,899,088
4,899,176
4,899,200
4,899,274
4,899,311
4,899,378
28 : 4,898,083
29 : 4,897,926
4,898,002
4,898,099
4,898,108
4,898,229
4,898,411
4,898,593
4,898,751
4,898,826
4,898,972
4,898,976
31 : 4,898,194
4,898,208
4,898,291
32 : 4,898,169
33 : 4,897,982
4,898,029
4,898,166
4,898,403
4,898,435
4,898,458
4,898,480
4,898,586
4,898,697
4,898,778
4,898,849
4,899,064
4,899,290
34 : 4,897,891
4,897,902
4,897,937
4,897,959
4,898,053
4,898,055
4,898,061
4,898,089
4,898,159
4,898,349
4,898,446
4,898,454
4,898,513
4,898,517
4,898,606
4,898,609
4,898,662
4,898,677
4,898,691
4,898,716
4,898,717
4,898,755
4,898,853
4,898,854
4,898,855
4,898,861
4,898,916
4,898,917
4,898,921
4,898,924

4,898,925
4,898,952
4,898,953
4,898,962
4,898,967
4,899,002
4,899,007
4,899,008
4,899,011
4,899,015
4,899,077
4,899,125
4,899,143
4,899,161
4,899,165
4,899,204
4,899,292
4,899,372
4,899,375
4,899,377
35 : 4,899,293
36 : 4,897,885
4,897,945
4,897,978
4,898,041
4,898,082
4,898,088
4,898,112
4,898,117
4,898,149
4,898,164
4,898,180
4,898,182
4,898,195
4,898,278
4,898,306
4,898,307
4,898,319
4,898,327
4,898,368
4,898,374
4,898,375
4,898,412
4,898,424
4,898,467
4,898,470
4,898,487
4,898,519
4,898,589
4,898,590
4,898,612
4,898,623
4,898,648
4,898,660
4,898,674
4,898,675
4,898,676
4,898,679
4,898,707
4,898,739
4,898,744
4,898,767
4,898,782
4,898,787
4,898,797
4,898,802
4,898,814
4,898,842
4,898,860
4,898,880
4,898,892
4,898,894
4,898,898
4,898,901
4,898,981
4,899,040
4,899,051
4,899,056
4,899,071
4,899,087

4,899,089
4,899,117
4,899,149
4,899,156
4,899,174
4,899,178
4,899,181
4,899,185
4,899,186
4,899,187
4,899,196
4,899,198
4,899,214
4,899,220
4,899,347
4,899,368
4,899,376
4,899,392
3,956,327
37 : 4,897,898
4,898,119
4,898,188
4,898,190
4,898,264
4,898,388
4,898,445
4,898,451
4,898,596
4,898,650
4,899,121
4,899,152
4,899,384
38 : 4,897,974
39 : 4,897,886
4,897,893
4,897,904
4,897,921
4,898,017
4,898,051
4,898,154
4,898,160
4,898,176
4,898,205
4,898,212
4,898,223
4,898,255
4,898,279
4,898,303
4,898,316
4,898,322
4,898,333
4,898,367
4,898,386
4,898,404
4,898,427
4,898,477
4,898,516
4,898,537
4,898,538
4,898,561
4,898,602
4,898,626
4,898,627
4,898,634
4,898,647
4,898,680
4,898,703
4,898,747
4,898,770
4,898,780
4,898,887
4,898,915
4,899,005
4,899,248
4,899,298
4,899,357
40 : 4,897,977
4,898,473
4,898,664

4,898,831
4,898,904
4,899,004
4,899,219
4,899,234
41 : 4,898,057
4,898,326
4,898,579
4,899,091
4,899,268
42 : 4,897,925
4,897,957
4,897,976
4,898,012
4,898,014
4,898,102
4,898,215
4,898,300
4,898,362
4,898,369
4,898,448
4,898,474
4,898,485
4,898,532
4,898,539
4,898,546
4,898,558
4,898,624
4,898,684
4,898,694
4,898,736
4,898,746
4,898,749
4,898,789
4,898,790
4,898,792
4,898,889
4,898,980
4,898,989
4,899,014
4,899,017
4,899,038
4,899,044
4,899,050
4,899,058
4,899,102
4,899,147
4,899,184
4,899,249
4,899,383
44 : 4,898,184
4,899,099
45 : 4,897,989
4,898,771
4,898,786
47 : 4,897,924
4,898,196
4,898,274
4,898,283
4,898,385
4,898,501
4,898,616
4,898,618
4,898,642
4,898,728
4,898,761
4,898,881
4,898,969
4,898,994
4,899,052
4,899,221
48 : 4,897,981
4,898,009
4,898,036
4,898,201
4,898,238
4,898,239
4,898,242
4,898,243

4,898,245
4,898,247
4,898,294
4,898,348
4,898,399
4,898,400
4,898,418
4,898,422
4,898,591
4,898,598
4,898,651
4,898,724
4,898,750
4,898,783
4,898,784
4,898,835
4,898,838
4,898,914
4,898,987
4,898,995
4,898,999
4,899,016
4,899,112
4,899,114
4,899,133
4,899,144
4,899,202
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4,899,322
49 : 4,897,941
4,898,163
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50 : 4,898,151
4,898,588
4,899,208
51 : 4,897,995
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4,898,192
4,898,198
4,898,224
4,898,704
4,898,874
4,899,164
4,899,356
53 : 4,897,928
4,898,199
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4,898,878
4,899,042
4,899,047
4,899,266
4,899,284
4,899,296
4,899,365
54 : 4,898,971
4,899,003
55 : 4,897,942
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4,898,133
4,898,158
4,898,261
4,898,275
4,898,553
4,898,628
4,899,053
4,899,388
56 : 4,898,106
4,898,121

DESIGN PATENTS

01 : 305,859
305,898
06 : 305,925
305,826
305,833
305,837
305,849
305,854
305,872
305,881
305,893
305,913
305,915

305,926
305,936
305,937
08 : 305,874
09 : 305,888
305,920
12 : 305,832
305,922
13 : 305,831
305,876
305,883
305,905
17 : 305,842

305,948
305,862
305,863
305,897
18 : 305,930
305,931
305,933
23 : 305,912
24 : 305,921
25 : 305,852
305,923
26 : 305,840
305,879

29 : 305,850
33 : 305,829
34 : 305,866
305,911
36 : 305,834
305,835
305,836
305,838
305,839
305,846
305,857
305,860

305,865
305,869
305,884
305,885
305,889
305,943
305,945
305,946
305,877
305,870
305,927
305,944

42 : 305,827
305,948
46 : 305,868
47 : 305,828
305,942
48 : 305,845
305,855
305,892
49 : 305,901
50 : 305,873
53 : 305,878
55 : 305,924

PLANT PATENTS

12 : 7,140
7,141
39 : 7,142

STATUTORY INVENTION REGISTRATIONS

01 : H747
06 : H732
H737
H742

24 : H730
H741
25 : H738

27 : H746
34 : H734
H739

H740
H713
35 : H728

H729
36 : H735
39 : H733

45 : H744
47 : H736
48 : H731

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